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RCRA Facility Assessment

Shell Oil Company
Martinez Manufacturing Complex

February, 1988

Management Consultants

> S9-053 Permits Sarah ATKEARVEY

February 18, 1988

Ms. Lucy Mlenar U.S. Environmental Protection Agency Region IX 215 Fremont Street San Francisco, CA 94105

Reference: EPA Contract No. 68-01-7374; Kearney Work

Assignment No. R29-07-01; Shell Oil Company

Final RFA Report

Dear Ms. Mlenar:

Enclosed is the final RCRA Facility Assessment for the Shell Oil Company, Martinez Manufacturing Complex in Martinez, California The complex occupies a £000-acre site on the south shore of the Carquinez Strait The facility began operating at this site in 1913 as a crude oil refining facility. The facility has also produced various chemical products, although most of the chemical production areas at the site are now inactive. In addition to oil products, the facility currently manufactures gasoline additives and catalysts

A total of sixty-eight SWMUs were identified in the course of this assessment. Seventeen of these units are inactive land treatment, landfill, or sump areas which were used for the treatment and disposal of process-generated refinery wastes. The facility has initiated an extensive environmental monitoring program for these units to satisfy the requirements of the California Water Code Calderon Requirements and the California Administrative Code, Title 23, Subchapter 15. In addition, the facility has conducted a surface impoundment sampling and analysis study of the wastewater treatment ponds and stormwater ponds to determine if these units are subject to the California Toxic Pits Cleanup Act of 1983. Additional information has been

Ms Lucy Mlenar February 18, 1988 Page 2

requested for two of the units at the site, the inactive oil collection tanks and sumps (Unit 4.5), and the inactive ballast water pond (Unit 4.15).

Please do not hesitate to call me or Barb Morson, the Work Assignment Manager, if you have any questions.

Sincerely,

Don R. Beasley

Technical Director

Enclosure

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RCRA FACILITY ASSESSMENT SHELL OIL COMPANY MARTINEZ MANUFACTURING COMPLEX MARTINEZ, CALIFORNIA

EPA Region 9 I.D. Number CAD009164021

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EXECUTIVE SUMMARY

A RCRA Facility Assessment (RFA) was performed to identify and assess solid waste management units (SWMUs) and other areas of concern at the Shell Oil refinery in Martinez, California. This review is based on information found in the RCRA and CERCLA files of EPA Region 9, files and reports of the California Department of Health Services (DOHS) and the San Francisco Bay Region of the California Regional Water Quality Control Board. The RCRA Part B permit application for the facility was also reviewed. The RFA utilizes records review, data evaluation, interviews, and a visual site inspection to evaluate the potential for releases of hazardous constituents from SWMUs and areas of concern identified during the assessment. The visual site inspection was performed on November 11, 12, and 13, 1987.

The Shell Oil Martinez facility was established at this location in 1913 with a product terminal. In 1916, Shell commenced refining operations at this site, and in 1931 constructed a chemical plant for the production of secondary butyl alcohol. The facility currently maintains a crude-run throughput of 107,400 barrels per day, and manufactures various hydrocarbon products, gasoline additives and catalysts. The facility has submitted a RCRA Part B permit application to operate a waste incinerator and three carbon monoxide boilers for waste disposal.

A total of 68 SWMUs were identified and evaluated in the course of this assessment. Thirteen of these units are inactive landfill or land treatment units that have documented releases to soil and/or groundwater. Two inactive sump areas also have documented releases to soil and/or groundwater. These units are currently being addressed in an environmental monitoring and assessment program to satisfy state regulatory requirements. This program includes a determination and verification of contaminant sources and recommendations for the mitigation of the contamination, including closure of the units.

There are six unlined ponds associated with wastewater holding or treatment, all of which are located in the same area and handle similar waste materials.

Releases of hazardous constituents to the groundwater have occurred downgradient of these ponds, although the specific source of these contaminants has not been identified.

Twenty nine of the units at the site had a low or no potential for past or ongoing releases to environmental media, based on their construction, operation, and waste management practices. Fourteen units had moderate or high release potentials based on their design or operation. Due to lack of information on the past operation of six of the units, the release potentials were not evaluated.

1.0 INTRODUCTION

The Shell oil refinery and manufacturing complex in Martinez, California occupies a 100-acre site on the south south shore of Carquinez Strait. This refinery, at this location since 1913, has operated a crude oil refining operation and has produced up to 50 different chemical products. Currently, most of the chemical production areas are now inactive and some have been dismantled. In addition to its oil products, the facility currently manufactures gasoline additives and catalysts.

The Shell facility generates a wide variety of oily waste materials from various production processes, as well as caustic wastes, and wastes containing tetraethyl lead. In the past, many of these wastes were disposed in landfills and land disposal units at the facility. The manufacturing complex has a large wastewater treatment system to treat process wastewaters, sanitary sewage and storm water prior to discharge to Carquinez Strait under NPDES permit. Some of the wastestreams are treated prior to discharge to this system.

The 1984 RCRA amendments provided new authority to EPA to require comprehensive corrective action on solid waste management units (SWMUs) and other areas of concern at facilities applying for Part B permits and those with RCRA interim status. The intent of this authority is to address previously unregulated releases of hazardous constituents to air, surface water, soil and groundwater and the generation of subsurface gas. In order to accomplish this objective, a RCRA facility assessment is undertaken consisting of a preliminary data review, a site visit and, when warranted, sampling and analysis.

This report represents an evaluation of SWMUs at the Shell Oil refining complex and, as such, it summarizes the results of a records review, data evaluation, and visual site inspection performed on the facility. Primary sources of information utilized for this review include the RCRA Part B permit application; RCRA and CERCLA files of EPA Region 9; files and inspection reports at the California Department of Health Services (DOHS) and the California Regional Water Quality Control Board, San Francisco Bay (RWQCB) files and inspection reports. The visual site inspection was conducted on November 11, 12, and 13, 1987.

Section 2.0 describes the facility and its operations. Information pertaining to the environmental setting is presented in Section 3.0. Section 4.0 provides a detailed description of all known solid waste management units. Finally, Section 5.0 presents findings of the preliminary file review and visual site inspection.

2.0 FACILITY DESCRIPTION

2.1 GENERAL DESCRIPTION

Shell Oil Company owns and operates a petroleum refinery and chemical manufacturing plant known as the Martinez Manufacturing Complex in Contra Costa County, California.(9) The complex occupies a 1000-acre site on the south shore of the Carquinez Strait, near the city of Martinez (Figures 1 and 2).(4) The refinery operates with a crude-run throughput of 107,400 barrels per day. (4) The products manufactured at the complex include gasoline, intermediate fuels (jet, diesel, stove, kerosene), industrial fuels, spray oils, lubricants, and asphalts.(4,20) The complex also manufactures a gasoline additive and catalysts.(4)

Shell began their operations at the Martinez location in 1913 with a product terminal.(17) In 1916, Shell began its first refinery at this location and processed 20,000 barrels of crude oil per day.(17) The facility's first chemical plant was constructed in 1931 and produced secondary butyl alcohol. (17) At one time, the facility produced about 50 different chemicals, including alcohols, solvents, peroxides, and catalysts.(17,20) Most of the chemical plants are now retired, although catalyst production continues.(17)

2.2 REGULATORY STATUS

Shell Oil Company's Martinez Manufacturing Complex was issued an Interim Status Document (ISD) by the California Department of Health Services (DOHS) in April, 1981, for the operation of a waste incinerator (Unit 4.55) and three sludge drying ponds (Unit 4.1).(6,9) Shell had submitted a RCRA Part A permit application for the incinerator in 1980 to EPA and DOHS, and subsequently, a RCRA Part B permit application in 1983.(4) The Part B permit application for the incinerator was revised and resubmitted to include the operation of three carbon monoxide boilers (Unit 4.49) and associated tanks (Unit 4.47 and 4.48) for waste disposal in 1986.(4)

The ISD issued in 1981 also included the operation of three sludge drying ponds (Unit 4.1).(6,9) Shell submitted Part A and Part B permit applications for this facility in 1982, in addition to a waste discharge permit application

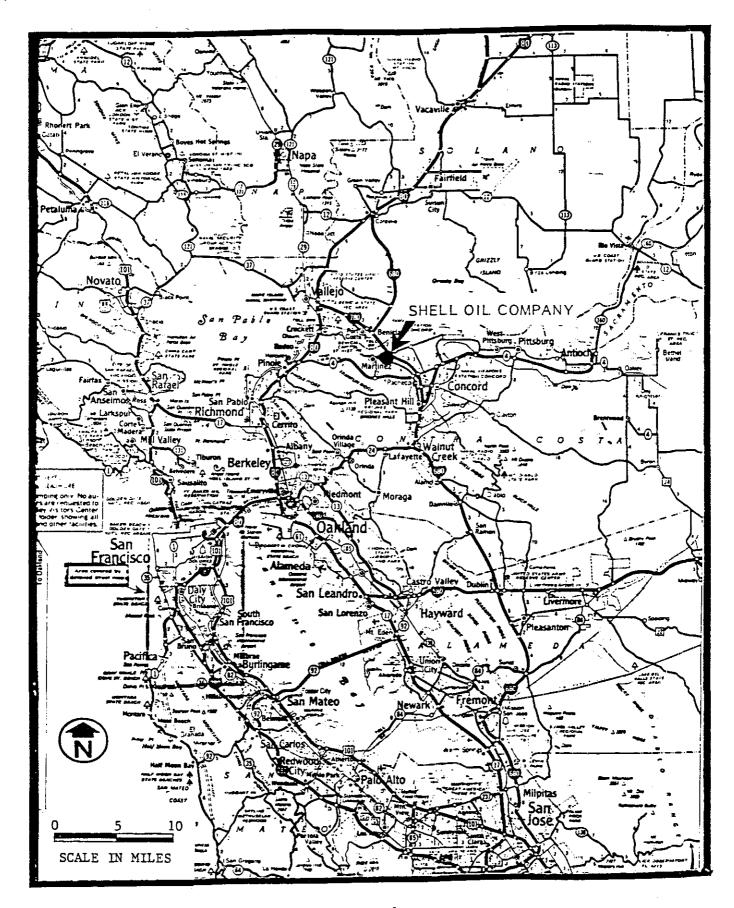


Figure 1

REGIONAL LOCATION OF SHELL OIL
Base Map: San Francisco Map, H.M. Gousha Company

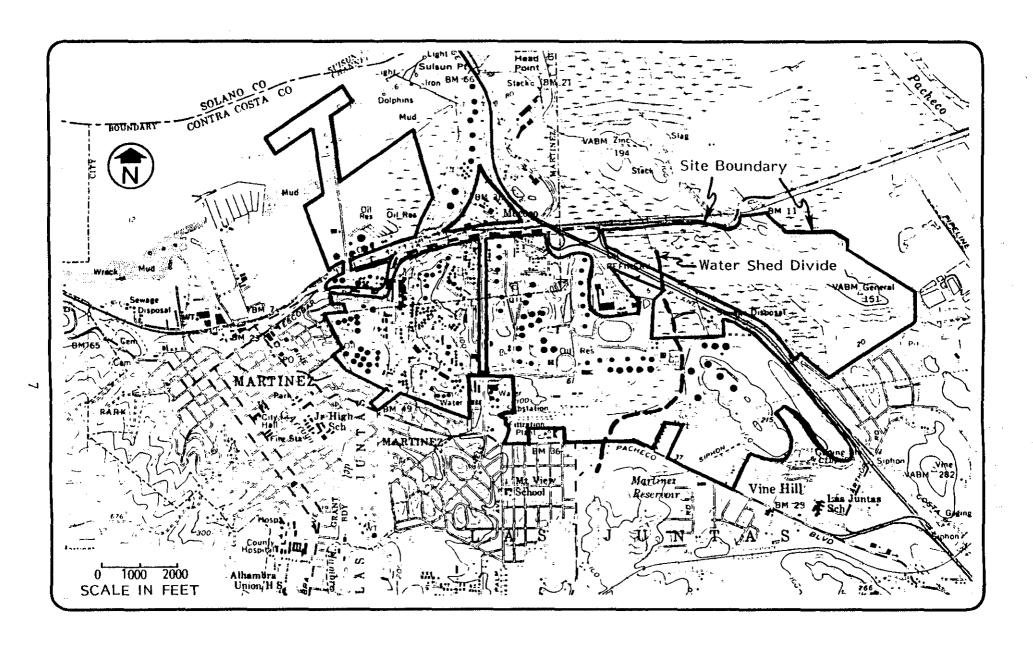


Figure 2

LOCATION MAP OF SHELL OIL COMPANY
Sources: USGS Benicia Quad, 1980 and Port Chicago Quad, 1968

to the California Regional Water Quality Control Board (RWQCB).(4,6,7) In 1983, The RWCQB issued a Waste Discharge Permit for this site which required an investigation to determine if prior use of the site for sludge drying had allowed migration of the waste materials beyond the containment dikes.(4,8) Shell began a site characterization study of this unit in 1984 in compliance with their Waste Discharge Permit.(9) This site characterization study is currently in progress as part of an overall facility-wide waste site investigation.(9,23) However, Shell no longer intends to use this site for sludge drying.(9)

Shell has initiated an environmental monitoring program for 17 inactive waste disposal units, which were used to dispose of process-generated refinery wastes. The purpose of this monitoring program is to address the California Water Code Calderon Requirements (Division 7, Chapter 4, Article 4, Section 13273) which requires owners of all solid waste disposal sites to conduct a series of environmental monitoring programs and to submit the result of the Solid Waste Assessment Test (SWAT) reports to the appropriate RWQCB. The monitoring program involved a soil-waste study and a groundwater sampling and analysis program. Shell submitted a SWAT report to RWQCB in June 1987.(29)

These monitoring activities also addressed in part the requirements of the California Administrative Code, Title 23, Subchapter 15. A Report of Waste Discharge (ROWD) was prepared for 16 land disposal units and submitted to the RWQCB on August 3, 1987. This study addressed the effects of the waste management units on groundwater quality.(30)

The facility has also conducted a surface impoundment sampling and analysis study to determine whether the surface impoundments are subject to the California Toxic Pits Cleanup Act of 1985. This investigation included an extensive sampling and analytical program of the wastewater treatment ponds and stormwater ponds to determine whether the ponds receive or contain hazardous wastes according to California Department of Health Services regulatory criteria (CAC, Title 22, Division 4, Chapter 30, Article 11). The Surface Impoundment Sampling and Analysis Report was submitted on June 19, 1987 to RWQCB.(27)

2.3 WASTEWATER/STORM WATER COLLECTION

The refinery has two major watersheds, divided into west and east watersheds as shown in Figure 2. Process wastewaters and stormwater in the west watershed are collected and contained by the refinery sewer system, which drains by gravity to the facility's main wastewater treatment system.(17) Since stormwaters and process wastewaters enter a common drain system and are not segregated, the stormwater is subject to contamination, requiring treatment before discuarge. Flow during storm periods exceeding treatment capacity is automatically or manually bypassed to an 8 million gallon stormwater holding pond (Unit 4.63) (Figure 3) for retention and later treatment along with process water.(17)

Process wastewaters in the east watershed are collected and routed to the gross oil separator (Unit 4.21) for preliminary treatment prior to discharge to the main wastewater treatment system in the west watershed.(17) In the east watershed, storm water is diverted to one of four stormwater retention ponds (Units 4.61, 4.62, 4.62, and 4.64) equipped with oil baffles and surface level weirs to retain settleable solids and floating oils.(29) The ponds discharge after separation to ditches which enter the Carquinez Strait.(29)

Sanitary sewage from the west half of the west watershed, including offices, laboratory, and shop wastes, is collected in a sanitary sewer which discharges to the master septic tank located in the main wastewater treatment system area.(17) The master septic tank discharges to a sump which is pumped to the main wastewater treatment system downstream of the API separator (Unit 4.26). This system collects approximately two-thirds of the total sanitary sewage generated at the facility.(17) All remaining sanitary facilities are served by individual septic tanks which discharge to the wastewater treatment system for treatment.(17)

2.4 WASTEWATER TREATMENT SYSTEM

The facility operates a 4.5 million gallon per day wastewater treatment system for the treatment of process wastewaters, stormwater, and sanitary wastes. (4,17,18) Sources of wastewater discharged to this system include all process wastewater, sanitary sewage after septic tank treatment, and about one-third

of the stormwater falling on the plant site.(17) Treated effluent is discharged to the Carquinez Strait under NPDES Permit No. CA000578, RWQCB Order No. 79-154.(4,18) Components of the wastewater treatment system are shown in Figure 3 and described below.

Prior to discharge to this main wastewater treatment system, some of the process wastewaters are provided preliminary treatment. This includes the separation of large amounts of oil from wastewater collected in the Light Oil Processing (LOP) area by the gross oil separator (Unit 4.21); the separation of oil from wastewater collected in the Operations Central (OPCEN) area by the corrugated plate separator (Unit 4.22); and the neutralization and removal of hydrogen sulfide from spent caustic wastewaters generated in the LOP and OPCEN areas by the spent caustic neutralizer (Unit 4.45).(18)

Wastewater treatment in the main treatment system begins with the separation of floating oils and settleable sludge in the API separators (Unit 4.26). Oils skimmed from the API separators are routed to Tank 1064 (Unit 4.59) prior to reprocessing in the Crude Unit. Sludges removed from the bottom of the API separators are routed to the sand boxes (Unit 4.27) for volume reduction.(4,18)

Effluent from the API separators is pH adjusted in the flash mixer/pH adjustment unit (Unit 4.29) prior to entering the two dissolved air flotation units (Unit 4.30). Flocculated material from the air flotation units is skimmed and pumped to Tank 1065 (Unit 4.47) for storage. The skimmed flocculated material is burned in the CO boilers (Unit 4.49) as an auxiliary fuel. Clarified effluent is discharged to the biotreater equalization feed ponds (Unit 4.32).(4,18)

Five feed pumps are provided to pump water from the equalization basins to the activated sludge biotreater (Unit 4.34). Within the biotreater, the organic wastes are degraded by aerobic microorganisms. Biotreater effluent requires clarification to remove the suspended solids formed during the process and as a result, is discharged to three, two-stage air flotation clarifiers (Unit 4.35). Clarifier effluent is then discharged to six sand filters (Unit 4.39) via the sand filter feed pond (Unit 4.38) for additional solids removal. Effluent from the sand filters gravity flows to the final holding pond (Unit 4.40) prior to discharge to Carquinez Strait.(18)

Excess suspended solids removed from the biotreater are routed to the biosludge air flotation thickener (Unit 4.36) to remove water. Thickened sludge is then pumped to Tank 1197 (Unit 4.37) and transferred to Tank 1065 (Unit 4.47) for eventual burning in the CO boilers. Effluent from the thickener unit is routed back to the biotreater.(18)

2.5 SOLID WASTE MANAGEMENT UNITS

A total of 68 solid waste management units (SWMUs) were identified at the Shell Oil Company, Martinez Manufacturing Complex. These SWMUs are listed in Table 1 and shown in Figures 3 through 11.

TANK 1350 CASSING ASE

STORAGE

Table 1

SHELL OIL COMPANY SWMUs

4.1	Inactive Land Treatment Area "FF" STORM HZC EMURGEN Y Inactive Unit "H" PONDS 8 9 F/O
4.2	Inactive Unit "H"
4.3	Inactive Unit "I"
4.4	Inactive Unit "L"
4.5	Oil Collection Tanks and Sumps
4.6	Inactive Landfill Area "M"
4.7	Inactive Landfill Area "O"
4.8	Inactive Land Disposal Area "Q"
4.9	Inactive Open Burning and Landfill Area "W"
4.10	Inactive Land Disposal Area "X"
4.11	Inactive Impoundment"Y"
4.12	Inactive Landfill Area "Z'"
4.13	Inactive Pond Area "AA"
4.14	Inactive Land Disposal Area "DD"
4.15	Inactive Ballast Water Pond
4.16	Inactive Oily Water Sump "N"
4.17	Inactive Oily Water Sump "K"
4.18	Hazardous Waste Drum Storage Area "J" A = Colon 14 Transfer Station "MM" V ASSESSED A COLON 1 LOSGIG AS
7.17	Habte Hanster beating in the Appendix and the Appendix an
4.20	PCB Storage Area√
4.21	Gross Oil Separator (Unit "U")
4.22	Corrugated Plate Interceptor (Unit "TT") \lor
	CPI Trash Screen and Waste Bin 🗸
4.24	CPI Dumpster Boxes Hall product V
4.25	API Separator Bar Screen and Trash Bin
4.26	API Separator (Unit "E")
4.27	Sand Boxes (Unit "II")
4.28	
4.29	Flash Mixer/ph Adjustment onit (onit r)
4.30	Dissolved Air Flotation Units (Unit "HR")
4.31	Final pH Adjustment Unit
4.32	Final pH Adjustment Unit \\ Biotreater Equalization Feed Ponds (Unit "D") \\ Emergency Wastewater Holding Ponds (Unit "C") \(\sqrt{2000}\) \(\sqrt{10000}\)
4.33	Emergency Wastewater Holding Ponds (Unit "C")

Table 1 (cont'd)

4.34 Activated Sludge Biotreater 4.35 Two-Stage Dissolved Air Flotation Clarifiers 4.36 Biotreater Sludge Thickener Unit (Unit "GG") $\sqrt{}$ 4.37 Biosludge Storage Tank 1197 V Mr. REAL WAS 4.38 Sand Filter Feed Pond Polio 519 (week 9.40) 4.39 Sand Filters V Not 3500 4.40 Final Holding Pond J Poul SA 15B 4.41 Sulfide Caustic Flash Pot 4.42 Caustic Knock-out Pot 4.43 Caustic Sump. 4.44 Spent Caustic Storage Tank 952 (Unit "PP") 4.45 Spent Caustic Neutralizer (Unit "V") 4.46 Tank 1068 Not Bedienese rok FW 4.47 Waste Storage Tank 1065 (Unit "G")√ 4.48 Waste Storage Tank 383 (Unit "S") ∨ 4.49 CO Boilers (Unit "T") √ 4.50 CO Boilers Dust Storage Hopper 4.51 CO Boilers Dumpster Box NOT ANY WITHE 4.52 CO Boilers Dust Storage Area 4.53 Inactive Organic Chloride Waste Storage Tank 881T 4.54 Waste Storage Tank 482 (Unit "B") √ 4.55 Waste Incinerator (Unit "Z") \square 4.56 Two ASD Filter Cake Storage Bins 4.57 PG&E Sludge Terraces 4.58 Spent Acid Storage Tank 1218 4.59 Tank 1064 \square 4.60 Tank 1063 4.61 Upper Lake Slobodnik (Stormwater Retention Pond) √ . 4.62 Lower Lake Slobodnik (Stormwater Retention Pond) V 4.63 Stormwater Holding Pond 4.64 Flare Area Stormwater Holding Pond\ 4.65 Vine Hill Stormwater Holding Pond 4.66 Stormwater Holding Ponds (Formerly LTA "FF") 8910 RMG 4.67 Inactive Unit "YY" 4.68 Inactive Unit "ZZ"

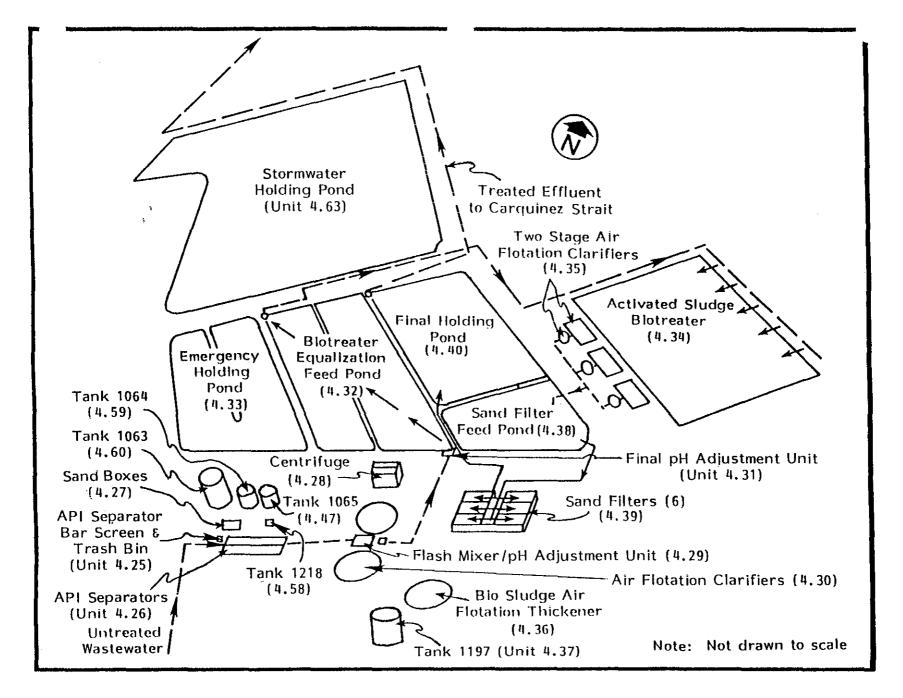


Figure 3

WASTEWATER TREATMENT SYSTEM - SHELL OIL COMPANY
Source: Reference 18

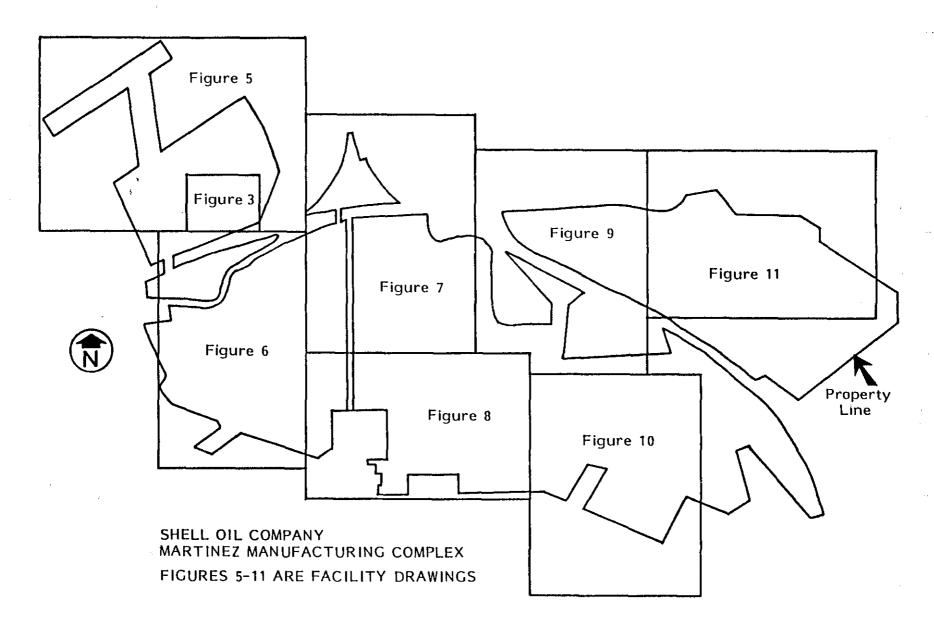


Figure 4
FACILITY INDEX MAP

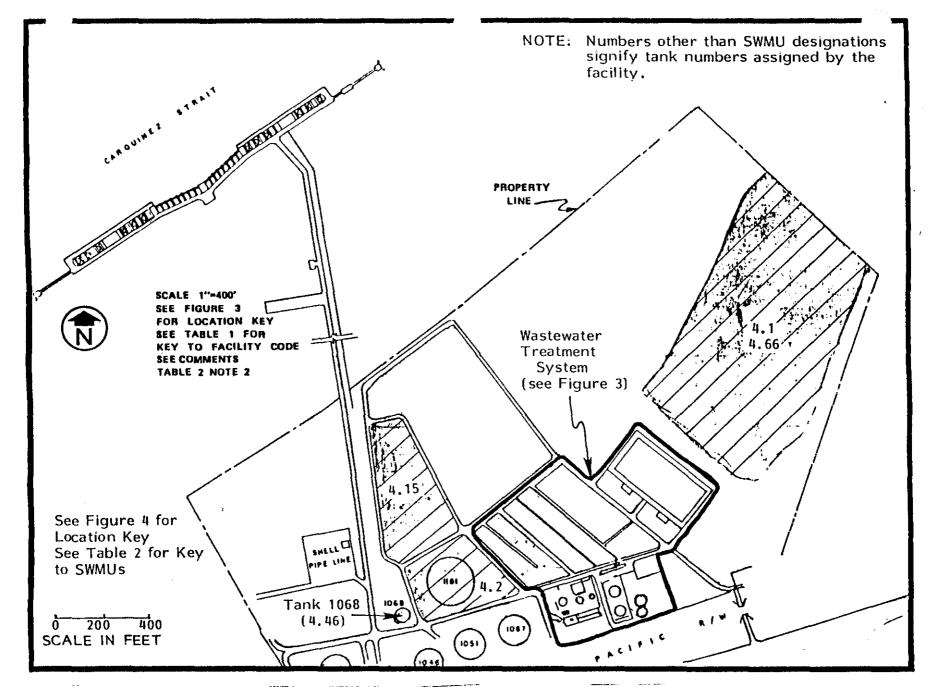


Figure 5

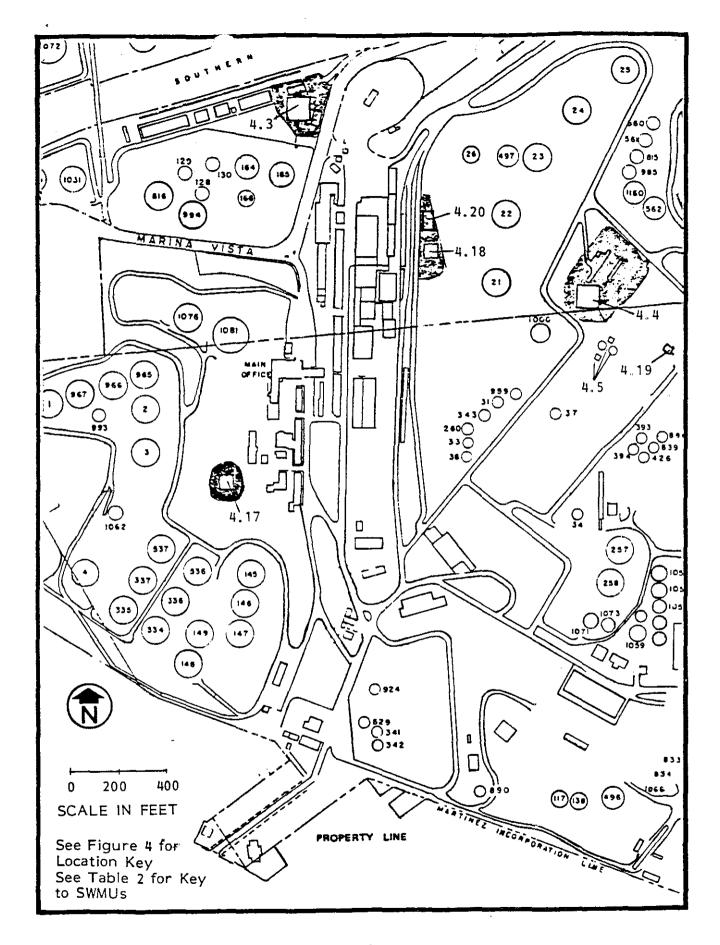


Figure 6
SHELL OIL COMPANY SWMUs

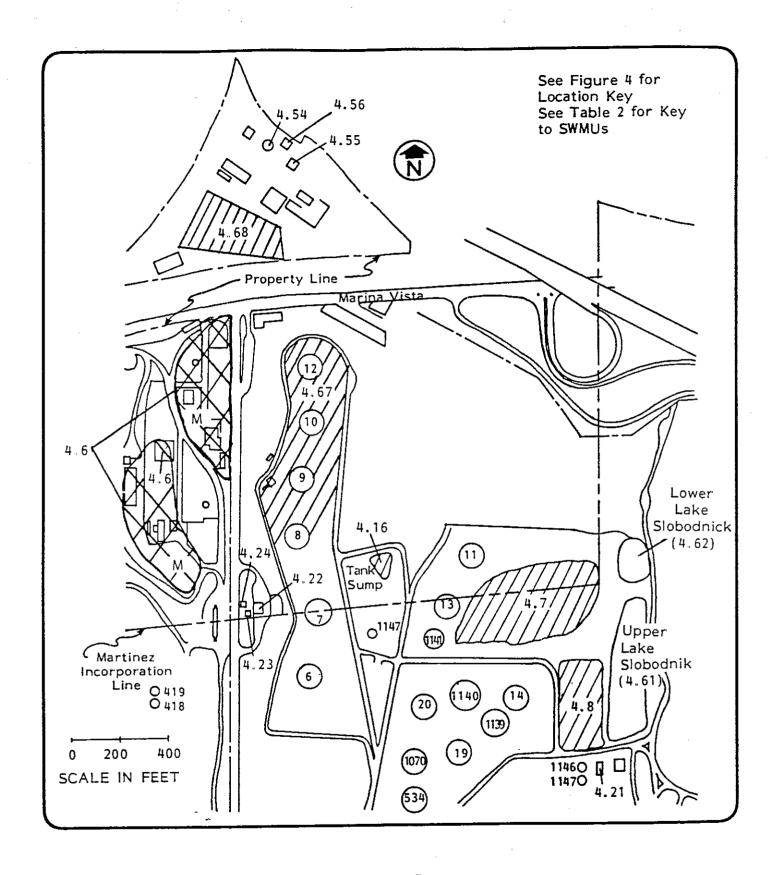


Figure 7
SHELL OIL COMPANY SWMUs

Figure 8
SHELL OIL COMPANY SWMUs

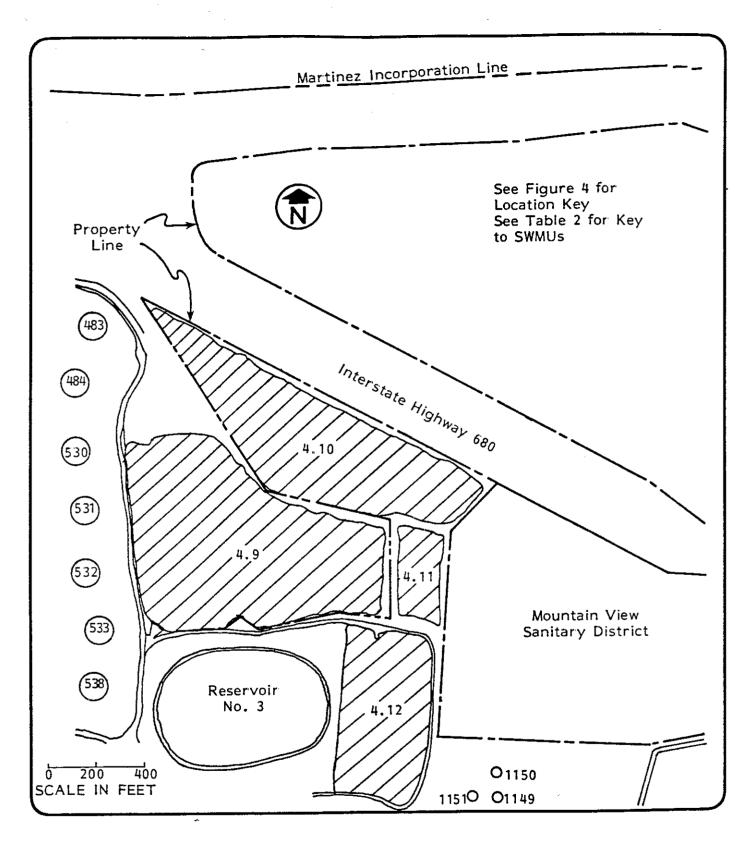


Figure 9
SHELL OIL COMPANY SWMUs

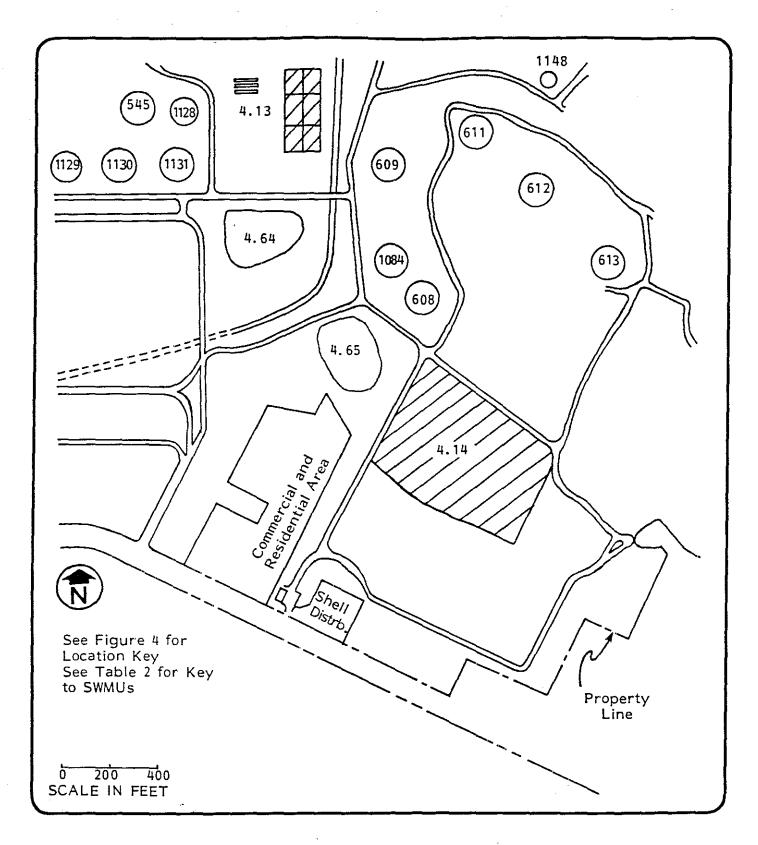


Figure 10
SHELL OIL COMPANY SWMUs

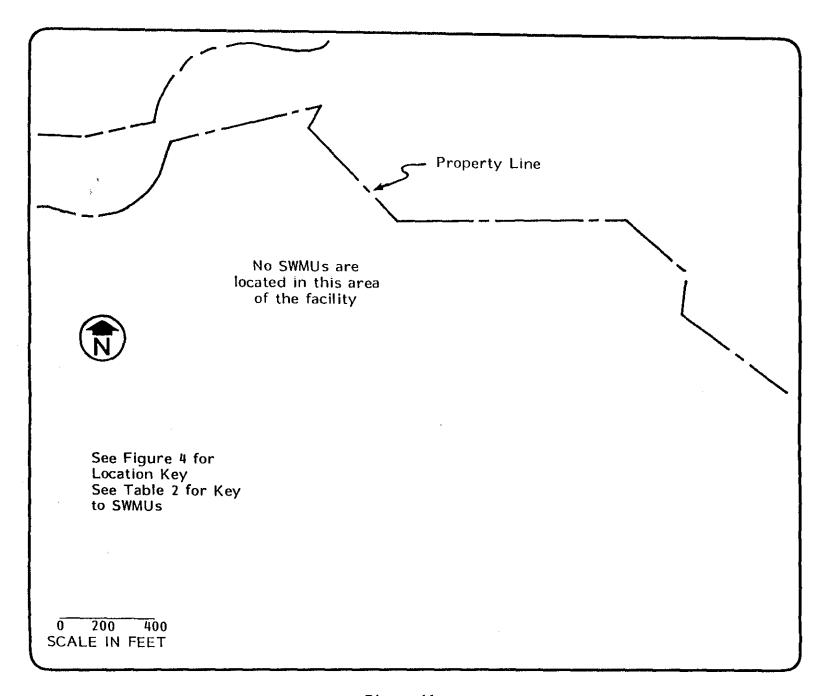


Figure 11
SHELL OIL COMPANY SWMUs

4.4 INACTIVE UNIT "L" (In Fire Training Area)

4.4.1 Information Summary

Unit Description: This inactive unit is located on the western portion of the facility property (Figure 6) and is designated as Unit "L" in facility correspondence.(1,2,3) This unit is shown in Photographs 71, 72, 73, and 74 in Appendix A.

This area was used for the disposal of asphalt pitch from the inactive vacuum re-run area.(1,3) Part of this area is now paved and used for a fire training area.(1,3) The unit was originally constructed as an impoundment, with a containment dam approximately 30 ft high at the base of the swale. The unit was 370 ft x 350 ft with depths up to 30 ft. Pockets of residual hydrocarbons and tetraethyl lead appear to be present within the unit.(29,30)

<u>Date of Startup</u>: This unit was first placed into service in the 1920's as a surface impoundment.(1)

Date of Closure: This unit was used until the mid-1960's.(1,30)

<u>Wastes Managed</u>: The area is known to have received asphalt pitch. Although chemical analyses for these wastes were unavailable for this review, pockets of residual hydrocarbon and tetraethyl lead appear to be present. (29,30)

Release Controls: The downslope side of the area is backed by a containment dam; no other release controls are known from the site's active operations. The facility indicates that one-third of the area has been paved with asphalt and two-thirds is covered with gravel.(30) Drains are present in both areas, which lead to the wastewater treatment system.(30)

History of Releases: Six soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 6.5 to 26.5 feet in depth and yielded 34 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) TOX

was also detected in soil samples.(3) In addition, high concentrations of sulfate and sulfide were found in these samples.(3) Samples from wells 171 (upgradient) and well 103 (downgradient) do not show elevated metals.(29)

A seep is present at the toe of the containment dam where the dam intersects the water table. This seep contains hydrocarbons, reportedly from Unit L or other "unknown sources." (30)

The area formerly occupied by this landfill area was inspected during the VSI. The area has been paved and is now occupied by a fire training area. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.4.2 Conclusions

Soil/Groundwater Release Potential: Soil releases have occurred and are ongoing. The presence of hydrocarbons on the water table in the location of the seepage through the dam indicates a high potential for past and ongoing release, even though the source of the hydrocarbons has not been specifically identified.

<u>Surface Water Release Potential</u>: Based on the location and drainage of the unit, there is no ongoing potential for direct release to surface water. The potential for past releases cannot be adequately evaluated due to the lack of information regarding unit operations.

Air Release Potential: Due to the lack of information on the unit's release controls and waste management practices, the potential for past releases cannot be evaluated. There is a low potential for ongoing releases to air as the unit is only partially covered and waste residues remain in the unit. Minor air releases may occur from the seep at the base of the containment dam.

Subsurface Gas Release Potential: High levels of sulfides and hydrocarbons were found in soil samples during the facility's waste site investigation, which may be indicative of anaerobic conditions in the subsurface environment. As a result, there is a potential for past and ongoing subsurface generation of methane from the anaerobic decomposition of the hydrocarbon wastes.

4.5 OIL COLLECTION TANKS AND SUMPS

4.5.1 Information Summary

Unit Description: These oil collection tanks and sumps are located adjacent to the inactive landfill "L" (Unit 4.4) (Figure 6).(1) These units are shown in Photographs 102 through 111 in Appendix A. The tanks and sumps collected wastewaters and cooling waters generated from process areas. The tanks served as skim tanks to remove oil from the wastewater.(26) The skimmed oil was collected and routed back into the process areas.(25)

Exact details of operation of this system are unknown. The system consisted of the following units:(25)

- Two below-grade covered concrete tanks, each with a diameter of approximately 15 feet and a depth of 20 feet.
- \bullet A concrete sump, partially below-grade, with dimensions of 4 ft x 4 ft x 5 ft deep.
- An unlined sump approximately 4 ft in diameter and 5 ft deep, covered with wooden boards.
- · A concrete overflow channel connected to both tanks.

At the time of the VSI, the two tanks were empty, although one contained oily sludges in the bottom. The two sumps were also empty. A lower grade area, adjacent to the unlined sump was heavily stained with an oily waste.(25) The facility has indicated that the sumps and tanks will be cleaned out and the residue disposed at a Class I landfill.(26)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: It is unknown when this unit became inactive.

Wastes Managed: A sample of the tank residue was collected and analyzed by the facility, although the analytical results were not available for this review. The facility has indicated that this sample contained metals below appropriate concentrations to classify the residue as hazardous waste. (26)

Release Controls: There is no available information concerning release controls for this unit.

History of Releases: There was no file record of releases from this unit. At the time of the VSI, soil releases had occurred in an area downgradient of the unit. (25)

4.5.2 Conclusions

Soil/Groundwater Release Potential: Past releases to soil have occurred from this unit. The potential for past releases to groundwater cannot be adequately evaluated due to lack of information on the operation of the unit. There is a low ongoing release potential to groundwater from this unit based on the waste residues remaining in the soil.

<u>Surface Water Release Potential</u>: Due to lack of information on the unit's operation, the potential for past surface water releases cannot be evaluated. There is no ongoing potential for surface water releases as this unit is inactive.

<u>Air Release Potential</u>: The potential for past releases to air cannot be adequately evaluated due to lack of information on the unit's operation. The unit is no longer in service, therefore, there is no ongoing air release potential.

Subsurface Gas Release Potential: The potential for the past generation of subsurface gas from this unit cannot be evaluated due to the lack of information on the unit's operation. There is no ongoing potential for the generation of subsurface gas as this unit is no longer in service.

4.6 INACTIVE LANDFILL AREA "M"

4.6.1 Information Summary

<u>Unit Description</u>: This inactive landfill is located on the north end of the facility property, just south of Marina Vista Road (Figure 7).(2) This area is shown in Photographs 75, 76, and 77 in Appendix A.

This area was used for the disposal of coke produced from the early Dubbs Cracking Units.(1,3,30) The area is now paved.(16) The asphalt plant and Chemical Units A and B have been built over this site.(3,25) This site was originally thought to be one continuous area, however, further research showed that it consisted of two separate lobes.(3) Information on the landfill dimensions, construction details, and waste management practices was unavailable for this review. Closure procedures, including any soil excavation activities, are unknown for this site.

Date of Startup: This unit was put into service in 1923.(1,3,30)

Date of Closure: The landfill was last used in 1930.(1,3,30)

Wastes Managed: The landfill received coke from the facility's Dubbs Cracking Units.(1,3) Coke is the residue from the cracking of petroleum or coal tar pitch, and is not expected to contain leachable quantities of metals.

Release Controls: There was no information in the files reviewed regarding release controls for this unit.

History of Releases: Sixteen soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 5.5 to 15.5 feet in depth and yielded 27 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) Petroleum hydrocarbons were observed in one of the soil borings.(29) Groundwater monitoring results have shown the presence of floating hydrocarbon

product in downgradient wells, although the source of this floating product is not attributed to the past use of this unit.(29) Samples from the downgradient wells have not shown contamination from metals.(29)

The area formerly occupied by this landfill area was inspected during the VSI. The area has been paved and is now occupied by chemical process areas. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.6.2 Conclusions

Soil/Groundwater Release Potential: Past soil releases have occurred from this unit, based on test boring results in 1987. There was no indication of past groundwater releases from this unit. There is a low potential for ongoing releases to groundwater from this unit as waste residues remain in the soil, although constituents of concern are not highly mobile.

<u>Surface Water Release Potential</u>: The potential for past releases to surface water cannot be evaluated because of lack of information of operations. Because the unit is covered with pavement, there is no ongoing release potential.

Air Release Potential: The potential for past air releases cannot be evaluated due to lack of information on unit operations. The unit is now closed and covered with paving; there is no potential for ongoing releases.

<u>Subsurface Gas Release Potential</u>: The potential for the generation of subsurface gas from this unit is moderate due to the presence of residual hydrocarbons in the soil.

4.7 INACTIVE LANDFILL AREA "O"

4.7.1 Information Summary

<u>Unit Description</u>: This inactive landfill area is located in the central portion of the facility (Figure 7) and is referred to as Unit "O" in facility correspondence.(1,2,3) This area is shown in Photographs 40, 41, 42, 43, and 44 in Appendix A.

This area was once a ravine, which was filled with miscellaneous wastes, trash, tergol clays, and construction debris.(1,3) This area was also used for sludge drying until 1975.(1,3) At this time, the area was levelled and covered.(1,3,16) The unit is triangular in shape, about 600 ft on a side and up to 28 ft deep.(30) The unit is currently used for scrap material and road fill storage, a sand blasting area, and as a temporary storage area for wastes generated from the shutdown of the flexicoker operation.(25)

Date of Startup: The landfill became active in 1940.(1)

Date of Closure: The landfill was last used in 1975.(1,3)

<u>Wastes Managed</u>: In addition to miscellaneous wastes, trash, and debris, tergol clays, which are used in lube oil processing, were disposed in this unit.(1,3) Sludges of unknown origin were also placed in the landfill for drying.(1,3) Chemical analyses of these wastes and sludges were not available for review.

Release Controls: No containment structures are known to exist for this unit. Fill was placed and graded to maintain an outer slope of approximately 2:1. The area drains directly to Lower Lake Slobodnik and thence to Vine Hill Creek and Peyton Slough through an NPDES outfall No. 002.(30)

History of Releases: Eleven soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 11.5 to 36.5 feet in depth and yielded 45 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total

organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) PCBs and petroleum hydrocarbons were also detected in soil samples.(29) In addition, high concentrations of sulfate, possibly indicating the presence of sulfuric acid, were found in these soil samples.(3) Groundwater quality did not appear to be affected by previous use of this unit based on the results of recent groundwater monitoring activities.(30)

The area formerly occupied by this landfill area was inspected during the VSI. The area was occupied by scrap material and road fill piles, a sand blasting area, and waste piles generated from the flexicoker shutdown. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.7.2 Conclusions

Soil/Groundwater Release Potential: Past soil releases have occurred from this unit, based on test boring results in 1987. There was no indication of past groundwater releases from this unit. There is a low potential for ongoing releases to groundwater from this unit as waste residues remain in the soil.

Surface Water Release Potential: The potential for past releases to surface water cannot be evaluated because of lack of information of operations. Waste residues remain in the soil which could contaminate surface runoff and as a result, there is a low ongoing potential for releases to surface water.

Air Release Potential: The potential for past air releases cannot be evaluated due to lack of information on unit operations. The unit is now closed and as a result, there is no potential for ongoing releases.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas from this unit is moderate due to the presence of residual hydrocarbons in the subsurface environment.

4.8 INACTIVE LAND DISPOSAL AREA "Q"

4.8.1 <u>Information Summary</u>

<u>Unit Description</u>: This inactive land disposal area is located in the central portion of the facility, adjacent to Lake Slobodnik (Figure 7) and is referred to as Unit "Q" on facility correspondence.(1,2,3) This area is shown in Photographs 45, 46, 47, and 48 in Appendix A.

This area was used for disposal of oily wastes, such as tergol clays.(1) The unit is located on the east-facing slope of a hill, adjacent to Lake Slobodnick, and has been the site of slumping due to its steep slopes. Regrading has been conducted several times, the most recent being in 1986, following soil slumping into Lake Slobodnik.(30) Although specific surface area information is not available, fill depths appear to be about 5 feet with some fill materials below the level of the Lake Slobodnik impoundment.(30)

Date of Startup: The area was put into service in 1940.(1)

Date of Closure: The unit became inactive in 1965.(1)

Wastes Managed: Oily wastes of unknown origin were placed in this area for landfarming.(1,16)

Release Controls: The unit is adjacent to and drains into Lake Slobodnik. (30)

History of Releases: Five soil borings were collected within this inactive land disposal area as part of a waste site investigation conducted by Shell.(3) The borings ranged from 10 to 21.5 feet in depth and yielded 8 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) In addition, high concentrations of sulfate, possibly indicating the presence of sulfuric acid were found in these samples.(3) Petroleum hydrocarbons were also detected in some of the soil samples.(29) Limited groundwater sampling showed mercury levels near its detection limit in one downgradient well, although mercury was not detected in the upgradient well.(29) A release of

mercury cannot be verified at this time due to the limited monitoring data. (29) Based on the results of other groundwater monitoring data, the unit did not appear to have released other metals or organic compounds to the groundwater. (29)

The area formerly occupied by this landfill area was inspected during the VSI. No evidence of past releases was observed at this time. (25)

4.8.1 Conclusions

Soil/Groundwater Release Potential: Past soil releases have occurred from this unit, based on test boring results in 1987. There is a low potential for ongoing releases to groundwater from this unit as waste residues remain in the soil.

Surface Water Release Potential: The potential for past releases to surface water cannot be evaluated because of lack of information on operations. Waste residues remain in the soil which could contaminate surface runoff and as a result, there is a low ongoing potential for releases to surface water.

Air Release Potential: The potential for past air releases cannot be evaluated due to lack of information on unit operations. There is no potential for ongoing releases, as this unit is inactive.

<u>Subsurface Gas Release Potential</u>: The potential for the generation of subsurface gas from this unit is moderate due to the presence of residual hydrocarbons.

4.9 INACTIVE OPEN BURNING AND LANDFILL AREA "W"

4.9.1 Information Summary

<u>Unit Description</u>: This inactive area is located on the northeastern end of the facility property, just south of Interstate 680 (Figure 9) and is designated as Unit "W" on facility correspondence.(1,2,3) This area is shown in Photographs 92, 93, and 94 in Appendix A.

This area was originally used for open burning and waste disposal of trash.(1, 3,16) The entire site is reported to be about 4 acres; burning occurred in a small "inlet" on a topographic low adjacent to the bay.(30) A private asphalt processing company now leases the land from Shell and has built their plant on the site.(1,3)

Date of Startup: This landfill was put into service in 1938.(1)

Date of Closure: The unit became inactive in 1970.(1)

<u>Wastes Managed</u>: Trash and oily wastes of unknown origin were disposed in this landfill.(1,3) In addition, some tetraethyl lead and laboratory containers containing unspecified wastes were burned in this area.(30) Chemical analyses of these wastes were unavailable for this review.

Release Controls: Information regarding release controls for this landfill was unavailable for this review. Drainage from this site is directed into Peyton Slough, an NPDES-regulated discharge channel.(29)

History of Releases: Four soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 6.5 to 26.5 feet in depth and yielded 34 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Wood fragments were observed at 14 feet in boring W-2.(29) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3)

Groundwater samples from "downgradient" well 177 indicates the presence of acetone and 1,2,-dichloropropane at very low levels. The facility indicates that these compounds are likely to originate from Unit W.(29,30) Metals were also slightly elevated.(30)

The area formerly occupied by this landfill area was inspected during the VSI. The area has been paved and is now occupied by a parking lot and partially by a building. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.9.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit is high based on existing contamination.

Surface Water Release Potential: Based on the location of the unit, there is a high potential that releases may have occurred when the site was active, although drainage into Peyton Slough is an NPDES-permitted discharge. The site is now entirely covered and paved; there is no remaining surface water release potential.

Air Release Potential: Air releases may have occurred when the unit was active, as burning was used as a disposal method. The site is now covered with pavement; there is no remaining potential for air release.

Subsurface Gas Release Potential: If anaerobic conditions occurred in the subsurface environment, there is a potential that methane may have been generated from the decomposition of the organic waste residues found in the subsurface. As these organic waste residues remain in the surbsurface, there is a low ongoing potential for the generation of subsurface gas from this unit.

4.10 INACTIVE LAND DISPOSAL AREA "X"

4.10.1 Information Summary

Unit Description: This inactive land disposal area is located on the north-eastern end of the facility property, just south of Interstate 680 (Figure 9) and is referred to as Unit "X" in facility correspondence.(1,2,3) This area is shown in Photographs 18 through 26 in Appendix A. This unit is located in a marshy area adjacent to Bay lands, where the water table is approximately two feet below ground surface.(30) An intermittent creek borders the east side of the unit and Peyton Slough runs along the northeast side of the unit.(25)

This area was used for the landfarming and disposal of sludges produced from various refinery activities.(1,3) The area was filled and covered in 1976 but was inactive for several years before that date.(1,3,29) The area is about 1700 feet by 450 feet with a depth of up to 10 feet.(30) The area is divided with a drainage channel that discharges into Peyton Slough.(25)

Date of Startup: This unit became active in 1964.(1)

Date of Closure: The land disposal area was last used in 1968 and covered in 1976.(1,3)

Wastes Managed: Sludges removed from inactive landfill area "H" (Unit 4.2), effluent treatment pond sludges, acid sludges, and "doctor" treated lead sludges were all placed in this land disposal area for treatment.(1,3,16,29,30) Chemical analyses of these sludges were unavailable for this review.

Release Controls: The unit was not lined or bermed.(25) Drainage from this site is directed into Peyton Slough, an NPDES-regulated discharge channel.(29)

History of Releases: Nineteen soil borings were collected within this inactive land disposal area as part of a waste site investigation conducted by Shell.(3) The borings ranged from 5.5 to 16.5 feet in depth and yielded 34 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII,

barium, chromium, nickel, and lead were detected in the soil samples.(3) TOX and petroleum hydrocarbons were also detected in soil samples.(3) A pH below six and elevated levels of sulfates detected in soil samples confirm the presence and potential migration of acid sludges.(29) Barium, potassium, and aluminum have been found at elevated levels in well 66, indicating a high potential for hazardous constituent mobilization.(29,30)

At the time of the VSI, several patches of an oily tar material were noted on the surface of the unit. The material appeared to be in a solid, stable form. It appeared as though the material originated from below the surface by upward seepage. Soil discolorations of an oily nature were also observed in the drainage channel bisecting the unit and in the intermittent channel along the east edge of the unit. (25)

4.10.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit is high based on existing contamination.

<u>Surface Water Release Potential</u>: Drainage from the unit was directed into Peyton Slough, an NPDES-regulated discharge channel. Waste residues remain in the unit which could contaminate surface runoff and as a result, there is a moderate ongoing potential for releases to surface water.

Air Release Potential: Air releases may have occurred when the unit was active. Although wastes appear to remain at the site, there is a low potential for ongoing air releases as these wastes are in a solid, stable form.

Subsurface Gas Release Potential: If anaerobic conditions occurred in the subsurface environment, there is a potential that methane may have been generated from the decomposition of the organic waste residues found in the subsurface. As these organic waste residues remain in the surbsurface, there is a low ongoing potential for the generation of subsurface gas from this unit.

4.11 INACTIVE IMPOUNDMENT "Y"

4.11.1 Information Summary

<u>Unit Description</u>: This inactive impoundment is located in the northcentral portion of the facility, just south of Interstate Highway 680 (Figure 9).(2) This impoundment is referred to as Unit "Y" in facility correspondence.(1,2,3) The area is shown in Photographs 14, 15, 16, and 17 in Appendix A.

According to the facility, this area was an old "soda sump", used for the disposal of tetraethyl lead, oily caustic wastes, and trash.(1,3) The dimensions of the unit are approximately 100 ft by 50 with an estimated depth of 16.5 ft or more.(30) The area is now a flat earthen area used for asphalt roofing material storage.(30)

Date of Startup: According to the facility's SWMU response, the impoundment became active in 1920.(1) More recent information indicated the unit became active in 1950.(30)

Date of Closure: This unit was taken out of service in 1970.(29)

Wastes Managed: The impoundment received tetraethyl lead wastes, caustic soda, oily caustic wastes, and trash.(1,3,29) It also received excavated wastes from Unit H (Unit 4.2).(29,30) Chemical analyses of these wastes were unavailable for this review, although tetraethyl lead is a hazardous constituent.

Release Controls: The unit was unlined when active. It is covered with an unknown amount of fill material.(30) Drainage from this site is directed into Peyton Slough, an NPDES-regulated discharge channel.(29)

History of Releases: Nine soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 5 to 16.5 feet in depth and yielded 43 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) TOX

was also detected in soil samples.(3) High sulfate levels and low pH, possibly indicating the presence of sulfuric acid, were also found in the soil samples.(3) Total petroleum hydrocarbons exceeded 10 percent in all but two borings. Groundwater samples from well 66 show elevated levels of phenols, and metals, and a depressed pH.(29)

The area formerly occupied by this impoundment area was inspected during the VSI. The area is now unpaved and occupied by piles of scrap building materials. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.11.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit is high based on existing contamination.

Surface Water Release Potential: Drainage from this unit into Peyton Slough was an NPDES-regulated discharge. Waste residues remain in the soil which could contaminate surface runoff and as a result, there is a low ongoing potential for releases to surface water.

Air Release Potential: Air releases may have occurred when the unit was active. There is no remaining potential for air releases as this unit is inactive as an impoundment.

Subsurface Gas Release Potential: If anaerobic conditions occurred in the subsurface environment, there is a potential that methane may have been generated from the decomposition of the organic waste residues found in the subsurface. As these organic waste residues remain in the surbsurface, there is a low ongoing potential for the generation of subsurface gas from this unit.

4.12 INACTIVE LANDFILL "Z'"

4.12.1 Information Summary

Unit Description: This inactive landfill is located on the northcentral end of the facility property, just south of Interstate Highway 680 (Figure 9) and is designated as Unit "Z'" in facility correspondence.(1,2,3) This area is shown in Photographs 11, 12, and 13 in Appendix A.

This area was used for land farming of oily wastes, tergol clays, tergol filter cake, calcium sulfonates, and trash.(1,3,29) The area covered by the unit was approximately four acres. According to the facility, the area was cleaned out during the installation of a tank farm area for Tanks T-1256 and T-1257, in 1983-1984.(1,3,29) The area was graded, filled, and asphalt paved.(25,30) Tanks T-1256 and T-1257 are product storage tanks and occupy about one acre each and are surrounded by road embankments and a reservoir embankment. Fill and aggregate materials have been placed and compacted around the base of the tanks.(30)

Date of Startup: The unit was placed into service in 1968.(1)

Date of Closure: The landfill became inactive in 1971 and was cleaned out in 1983-1984.(1,3)

Wastes Managed: The landfill received unspecified oily wastes, tergol clays, tergol filter cake, and trash.(1,3,29) Calcium sulfonates and Perma-16 filter cake were also disposed in this area.(29) Chemical analyses of these wastes were not available for this review.

Release Controls: The unit was unlined and unbermed.(25) Drainage from the site was directed into Peyton Slough, an NPDES-regulated discharge.(29)

History of Releases: Eleven soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 11 to 16.5 feet in depth and yielded 15 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII,

barium, chromium, nickel, and lead were detected in the soil samples.(3) TOX was also detected in soil samples.(3) Petroleum hydrocarbons were found in three boring at 5-10 ft below present ground surface. Groundwater monitoring has revealed elevated levels of nickel in well 148, downgradient from this unit.

The area formerly occupied by this landfill area was inspected during the VSI. The area has been paved and is now occupied by Tanks 1256 and 1257. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.12.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit is high based on existing contamination.

Surface Water Release Potential: Drainage from this area was directed into Peyton Slough, an NPDES-permitted discharge. There is no ongoing release potential to surface water as this unit is no longer active and has been paved over.

Air Release Potential: Air releases may have occurred when the unit was active. The site is now covered with pavement; there is no remaining potential for air release.

Subsurface Gas Release Potential: If anaerobic conditions occurred in the subsurface environment, there is a potential that methane may have been generated from the decomposition of the organic waste residues found in the subsurface. As these organic waste residues remain in the surbsurface, there is a low ongoing potential for the generation of subsurface gas from this unit.

4.13 INACTIVE POND AREA "AA"

4.13.1 Information Summary

Unit Description: This inactive area is located on the southeastern portion of the facility property, just south of the Mountain View Sanitary District Facility (Figure 10) and is designated as Unit "AA" in facility correspondence.(1,2,3) This area is shown in Photographs 27 to 37 in Appendix A. The unit has also been referred to as "settling ponds for cracking catalyst slurry".(16) This unit operated with a discharge permit issued by RWQCB.(29)

The area consisted of six ponds used to decant water from a fluid catalytic slurry used in catalyst cracking.(1,3) The ponds were formed by a series of earthen dikes within a two-acre area of the property, the vertical extent of waste is estimated to be less than seven feet.(30) According to the facility, the catalyst fines were dried and removed to an offsite private landfill.(1,3) The ponds are reported to drain from one to the other in a south-north direction, eventually discharging to Peyton Slough via Vine Hill Creek.(29,30)

Date of Startup: The landfill was placed into service in 1966.(1,3,29)

Date of Closure: The unit became inactive in 1971.(1,3,29)

<u>Wastes Managed</u>: Catalyst slurries from fluid catalytic cracking operations were placed in this landfill for treatment.(1,3) Unspecified water treatment chemicals, used to chelate metals, were involved in the treatment process. (1,3) Although chemical analyses of these wastes were not available for this review, the facility indicates that the wastes may have contained metals.(3)

Release Controls: The ponds were surrounded by four-foot high earthen berms. Drainage from this unit was directed into Peyton Slough, an NPDES-permitted discharge. (29)

History of Releases: The facility indicates these ponds "overflowed into Vine Hill Creek on numerous occasions", in response to storm events.(30) Eight soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 6.5 to 11.5

feet in depth and yielded 8 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) In addition, high concentrations of sulfate were found in these samples, possibly indicating the presence of sulfuric acid.(3) Groundwater samples from well 90 have shown elevated levels of manganese, nickel, magnesium, aluminum, and cobalt.(29)

The area formerly occupied by this landfill area was inspected during the VSI. Some deposits of a white, powdery material were present in some of the beds. These deposits appeared to be in a stable, unreactive form. (25)

4.13.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit is high based on existing contamination.

Surface Water Release Potential: Drainage from this unit into Peyton Slough was an NPDES-permitted discharge. Although some residues remain at the site, there is a low potential for ongoing surface water releases as these wastes appeared to be in stable unreactive form.

Air Release Potential: There was a low potential for past air releases based on the types of waste treated in this unit. Although residues remain in the unit, there is a low potential for ongoing air releases as these wastes appeared to be in a stable, unreactive form.

<u>Subsurface Gas Release Potential</u>: **Based on the inorganic nature of wastes** managed in this unit, there is no potential for the past or ongoing generation of subsurface gas from this unit.

4.14 INACTIVE LAND DISPOSAL AREA "DD"

4.14.1 Information Summary

Unit Description: This inactive land disposal area is located in the southern portion of the facility, just north of Pacheco Boulevard (Figure 10) and is referred to as Unit "DD" in facility correspondence.(1,2,3) This area is shown in Photographs 1 to 10 in Appendix A.

The 7-acre area was used for land disposal of tergol clays and oily wastes. (1,3) Since 1975, the area has been used for the disposal of fill material and construction debris.(29) The fill material in this unit reaches a thickness of up to 25 ft.(30)

Date of Startup: The unit became active in 1935.(1)

Date of Closure: The area was last used for clay and oily waste disposal in 1975; it is currently used for disposal of construction debris. (1,29,30)

<u>Wastes Managed</u>: The land disposal area received tergol clays and oily wastes of unknown origin.(1,3) Chemical analyses of these wastes were unavailable for this review.

Release Controls: The area is unlined and unbermed.(25) Drainage from the site is to the southwest and enters a drainage ditch that flows into Vine Hill Pond (Unit 4.65). Discharge from this pond is to Peyton Slough which is an NPDES-regulated discharge.(29)

History of Releases: Twenty-one soil borings were collected within this inactive landfill as part of a waste site investigation conducted by Shell.(3) The borings ranged from 5.5 to 46.5 feet in depth and yielded 59 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) TOX was also detected in soil samples.(3) In addition, high concentrations of sulfate were found in these samples, possibly indicating the presence of sulfuric acid.(3) Groundwater samples from well 161 show slightly elevated levels of aluminum, mercury and arsenic; the exact origin of these metals cannot be determined.(29)

The area formerly occupied by this land disposal area was inspected during the VSI. There were several piles of fill material present at the site. No evidence of past releases was observed.(25)

4.14.2 Conclusions

Soil/Groundwater Release Potential: Soil and groundwater releases have occurred from this unit. The potential for ongoing releases to soil and groundwater from this unit are high based on existing contamination.

Surface Water Release Potential: Drainage from this site was collected in the Vine Hill Pond and discharged to Peyton Slough, an NPDES-regulated discharge. Waste residues remain in the soil which could contaminate surface runoff and as a result, there is a moderate ongoing potential for releases to surface water.

Air Release Potential: Air releases may have occurred when the unit was active. There is no ongoing air release potential from the site as it is no longer used for waste disposal.

Subsurface Gas Release Potential: If anaerobic conditions occurred in the subsurface environment, there is a potential that methane may have been generated from the decomposition of the organic waste residues found in the subsurface. As these organic waste residues remain in the surbsurface, there is a low ongoing potential for the generation of subsurface gas from this unit.

4.15 INACTIVE BALLAST WATER POND

4.15.1 <u>Information Summary</u>

Unit Description: This unit is located on the northwest end of the facility property (Figure 5), and is designated as Unit "B" in facility correspondence. (1,2,3) This unit is shown in Photographs 199 and 200 in Appendix A. The pond occupies an area of approximately four acres. (25)

Information on the use and operation of this pond is lacking at this time. Two references indicate that this pond was used for treatment of ship ballast water.(1,3) Treatment consisted of suspended solids removal and oil skimming. (1,3) The facility has indicated that the unit may have been used for effluent sludge drying.(26) The facility has also indicated that the unit will be included in their Report of Waste Discharge submittal to RWQCB.(26)

Date of Startup: This unit began operating in 1920 as a ship ballast water treatment pond.(1,3)

Date of Closure: The pond became inactive in 1957.(1,3) It is unknown when this unit was used for sludge drying.

<u>Wastes Managed</u>: The pond received ballast water from ships.(1,3) Although no chemical analyses were available for this review, it is expected that these wastes contained 40 CFR 261, Appendix VIII constituents, including heavy metals and complex hydrocarbons associated with ship ballast water. Chemical analyses of the sludges reportedly dried in this unit were not available.

Release Controls: The unit is an unlined open pond, surrounded by six-foot high earthen berms.(25) Points of waste discharge and overflow controls are unknown.

History of Releases: There was no file record of releases from this unit. At the time of the VSI, the pond was empty, although some oily sludges appeared to be present in the unit. Some rainwater was also accumulating in the unit.

4.15.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater from this unit cannot be adequately evaluated at this time due to lack of information on the unit's use, operation, and waste management practices.

Surface Water Release Potential: The surface water release potential, both past and ongoing, cannot be evaluated until information is obtained regarding the unit's use, operation, and waste management practices.

<u>Air Release Potential</u>: Due to lack of information on the unit's use, operation, and waste management practices, the air release potential, both past and present, cannot be adequately evaluated at this time.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas from this unit cannot be determined until information is obtained regarding the unit's use, operation, and waste management practices.

4.16 INACTIVE OILY WATER SUMP "N"

4.16.1 Information Summary

<u>Unit Description</u>: This inactive oily water sump was located in the north central portion of the facility (Figure 7), and is designated as Unit "N" in facility correspondence.(1,2,3) This area is shown in Photographs 38 and 39 in Appendix A. This area has been referred to by the facility as the Old Fairview sump, used for collecting and storing tank drainage and surface runoff.(1,3)

The sump and underlying material were reportedly removed during a construction project in the early 1980's.(1,3,30) Some contaminated soil may have been blended in with noncontaminated soil and recompacted during the construction activities.(1) The site has been graded and is now partially covered with an asphalt paved road.(3,30) Specific details on the unit's construction, operating conditions, and waste management practices were unavailable for this review.

<u>Date of Startup</u>: Dates of startup for this unit are variable, depending on the source. One source indicated the unit became active in 1940 (1), another indicated the unit became active in 1921.(30)

<u>Date of Closure</u>: Dates of closure are also variable. One source indicated the unit was taken out of service in 1975 (1), another indicated the unit became inactive in 1966.(30)

<u>Wastes Managed</u>: Surface runoff and oil/water emulsion tank drainings were collected and stored in this unit.(30) Chemical analyses of these wastes were unavailable for this review.

Release Controls: Drainage from this unit was collected and routed to the wastewater treatment system. (29) File information regarding additional release controls for this unit was lacking.

History of Releases: Two soil borings were collected within this inactive sump area as part of a waste site investigation conducted by Shell.(3) The borings were 31 and 31.5 feet in depth and yielded 7 samples.(3) Samples were

analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) In addition, high concentrations of sulfate were found in these samples.(3) Based on the results of groundwater monitoring for this unit, it appears that no releases to groundwater have occurred at a result of the operation of this unit.(30)

The area formerly occupied by this sump was inspected during the VSI. The area is partially covered with a paved road. As a result, any past releases which may have occurred from this unit were not readily observable. (25)

4.16.2 Conclusions

<u>Soil/Groundwater Release Potential</u>: Based on the results of soil sampling it appears that soil releases have occurred. There was no indication of past groundwater releases from this unit. There is a low potential for ongoing releases to groundwater as contaminated soils are still present.

<u>Surface Water Release Potential</u>: Drainage in this area was collected and routed to the wastewater treatment system. There is no ongoing potential for surface water releases as this unit is no longer in service.

Air Release Potential: Due to lack of information on the unit's construction, and operation, the past air release potential cannot be adequately evaluated at this time. There is no ongoing air release potential from this unit as it is no longer in existence.

Subsurface Gas Release Potential: The potential for the past generation of subsurface gas from this unit cannot be determined until information is obtained regarding unit construction and operation. As this unit is no longer operational, there is no ongoing potential for the generation of subsurface gas from this unit.

4.17 INACTIVE OILY WATER SUMP "K"

4.17.1 Information Summary

Unit Description: This inactive oily water sump is located on the west side of the facility property, on the east slope of Crude Hill (Figure 6) and is designated as Unit "K" on facility correspondence.(1,2,3) This area is shown in Photographs 66 to 70 in Appendix A.

This unit was used during early refinery operations for the collection of tank leakage and surface runoff from the diesel and fuel oil tank farm on Crude Hill.(1,3,29) The area currently collects stormwater runoff.(29) Information on the unit's construction, operation, and waste management practices were unavailable for this review.

Date of Startup: The sump became active in 1916.(1)

Date of Closure: The unit was taken out of service in 1960.(1)

<u>Wastes Managed</u>: The sump collected oily wastewaters from tank farm leakage and surface runoff.(1,3) Chemical analyses of these wastes were unavailable for this review.

Release Controls: The center of the unit contains a drain that is connected to the wastewater treatment system.(25) There are no other known release controls for this unit.

History of Releases: Four soil borings were collected within this inactive sump area as part of a waste site investigation conducted by Shell.(3) The borings ranged from 4 to 6.5 feet in depth and yielded 9 samples.(3) Samples were analyzed for metals, chloride, sulfate, sulfide, pH, and total organic halogens (TOX).(3) Of the metals listed in 40 CFR 261, Appendix VIII, barium, chromium, nickel, and lead were detected in the soil samples.(3) Petroleum hydrocarbons were also found in the soil borings.(29) Based on the results of groundwater monitoring for this unit, it appears that no releases to groundwater have occurred at a result of the operation of this unit.(30)

This area was inspected during the VSI. An oily waste material was present in the center of the site, along the drainage channel leading to the sewer drain. No evidence of releases was observed offsite. (25)

4.17.2 Conclusions

Soil/Groundwater Release Potential: Based on the results of soil sampling it appears that soil releases have occurred. There was no indication of past groundwater releases from this unit. There is an ongoing potential for releases to soil and groundwater as oily wastes are still present at the site.

Surface Water Release Potential: Drainage in this area is collected and routed to the wastewater treatment system. There is a high ongoing potential for surface water releases based on the topography of the unit and presence of oily wastes in the unit.

Air Release Potential: This sump area was an above-ground open unit. As a result, there was a moderate potential for air releases from this unit. As wastes remain in the unit, there is a low ongoing potential for air releases.

Subsurface Gas Release Potential: There is a low potential for the past generation of subsurface gas from this unit as soil releases have occurred. There is an ongoing potential for the generation of subsurface gas from this unit if subsurface anaerobic conditions prevail as wastes are still present at the site.

4.18 HAZARDOUS WASTE DRUM STORAGE AREA "J"

4.18.1 Information Summary

Unit Description: This active hazardous waste drum storage area is located on the west end of the facility property (Figure 6) and is designated as Unit "J" in facility correspondence.(1,2,18) This unit is shown in Photographs 95 to 100 in Appendix A. This area is used for temporary storage of containerized wastes generated from process areas.(1,18) The area is cleared and the drums are hauled to an offsite disposal facility at least once every 90 days.(18) The facility indicated that no drums are filled in this area.(1,16)

The area is asphalt paved, approximately 40 feet by 50 feet in area, and has a storage capacity for 70 to 80 drums.(1,25) The area is surrounded by a 4-inch high, 4-inch wide asphalt curb and a six-foot high, locked chain-linked fence.(25)

Date of Startup: This unit was placed into service in 1980.(1,16)

Date of Closure: This drum storage area is an active unit. (25)

<u>Wastes Managed</u>: Waste types stored in this area consist mainly of solid materials generated from clean out operations such as coke residues, tank bottoms, and filter cartridges. These solids may contain metals exceeding EP Toxicity limits and/or oils.(25)

At the time of the VSI, a total of 30 drums were present in this storage area. Nine of drums contained tertiary butyl alcohol solids from tank cleaning operations, 19 drums contained slop tank wastes consisting of butyl formate, and two drums contained spent cartridge filters from a gasoline filtering process.(25)

Release Controls: The storage area is asphalt paved and curbed, although the asphalt is not coated with a sealant. The drums are covered and stored on pallets.(25) Rainwater accumulating within the curbed area drains outside of the curb to an unpaved area northwest of the unit by a valved drain pipe. A

storm drain inlet is located adjacent to the southwest corner of the unit to collect stormwater accumulating outside of the curbed area. The storm drain is connected to the process sewer. (25)

According to the facility, the drums are checked for leaks on a weekly basis. Drums with the potential for leaking are placed in recovery drums.(1)

History of Releases: There was no file record of releases from this unit. At the time of the VSI, the drums appeared to be in good condition, with no evidence of spillage or leakage. Some deterioration of the asphalt curb on the south and west edge of the storage area was noted, although the curb would be able to contain any spillage in the area. It was also noted that the unit is subject to stormwater run-on from an eroded drainage channel on a steep embankment adjacent to the east edge of the storage area. Sediment has been deposited behind the curb, which could allow run-on into the drum storage area. (25) Since the VSI, the facility has removed the sediment accumulating along the curb and extended the height of the east curb with a wooden board. (26)

4.18.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater due to drum leakage or spillage is low based on the unit's asphalt pavement and curbing. Recent efforts by the facility to control stormwater run-on reduce the ongoing potential for release to soil and groundwater by overflow from the unit.

Surface Water Release Potential: This drum storage area is located in a area where storm water is collected in a combined sewer system and routed to the facility's wastewater treatment system. As a result, there is a very low potential for past and ongoing releases to surface water due to overflow from the unit.

Air Release Potential: There is a low air release potential, both past and ongoing, from this unit since the drums are covered.

Subsurface Gas Release Potential: There is no potential for the past and ongoing generation of subsurface gas based on the unit's asphalt pavement and curbing.

4.19 WASTE TRANSFER STATION "MM"

4.19.1 Information Summary

Unit Description: This waste transfer station is located in the western portion of the facility (Figure 6) and is designated as Unit "MM" in facility correspondence.(1,2,16,18) This unit is shown is Photographs 112 to 119 in Appendix A. The waste transfer station consists of two adjoining areas, a south and north area. The south area is approximately 100 ft x 100 ft, concrete paved, and uncurbed. The north area is an unpaved area, approximately 100 feet x 60 feet, and about six feet lower in elevation than the south area. A six-foot high concrete retaining wall separates the two areas. A six-foot high chain-linked fence borders the east side of both areas and south side of the south area. Access to the areas is controlled by two separate locked gates on east side of each the areas. An embankment borders the north side of the north area. A sloped concrete retaining wall borders the west side of both areas with the crest providing a small berm for the west edge of the north area. (25)

The waste transfer station is used for the collection and temporary storage of 20 cubic yard portable bins containing potentially hazardous wastes.(1,16,18) The bins are owned by a private disposal company which hauls them to an off-site disposal site.(18) According to the facility, the bins are filled elsewhere and moved to this waste transfer station for a storage period of less than 90 days, prior to offsite disposal.(1,16,18) The total capacity of this waste transfer station is approximately 1000 cubic yards.(1)

Date of Startup: The unit became active in 1980.(1)

Date of Closure: This waste transfer station is an active unit. (25)

<u>Wastes Managed</u>: One bin in this area is used to collect asbestos. Other bins are used to collect sulfur, asphalt, lime, oily trash, and non-hazardous trash.(1,25) The unit is also used as a transfer area for potentially contaminated soil prior to offsite disposal.(1)

At the time of the VSI, the south storage area contained an asbestos storage bin, approximately 20 empty drums, and a recovery drum for waste oil. The north storage area contained a non-hazardous trash storage bin and a hazardous waste storage bin used for the disposal of oily rags and cardboard, and solids collected from the bar screen unit of the wastewater treatment system (Unit 4.25).(25)

Release Controls: The storage bins are covered. The south storage area is paved but uncurbed. The north area is unpaved but partially bermed along the west edge. (25) Within the south area, two storm drain inlets collect stormwater and any possible waste spillage. The storm drains are connected to the process sewer system. There are no storm drain inlets within the north area, however, drainage from the unit is collected in nearby storm drains. (25)

History of Releases: There was no file record of releases from this unit. There was no evidence of releases observed during the VSI. The concrete pavement in the south area appeared to be in good condition. The storage bins were also observed to be in good condition.

4.19.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater from the south storage area is low based on the concrete pavement and the containment of wastes in bins. Within the north area, however, there is a high potential for release to soil if any spillage from the hazardous waste storage bin occurs as the area is unpaved. In addition, spillage from the hazardous waste storage bin in the north area may create a potential for release to groundwater due to the proximity of the water table to the ground surface (approximately 30 feet) and permeability of the soils.(30)

Surface Water Release Potential: There is a very low potential for past and ongoing releases to surface water from the south area as stormwater and any possible spillage within this area are collected by the storm drains and routed to the facility's wastewater treatment system. Although the north area is unpaved and only partially bermed, there is a low potential for release to surface water as drainage from the north area would eventually be collected by nearby storm drains and routed to the wastewater treatment system.

Air Release Potential: There is a low air release potential, both past and ongoing, from this unit since the wastes are stored in covered bins.

Subsurface Gas Release Potential: There is no potential for the generation of subsurface gas from the unit based on the above-ground location of the bins and waste management practices.

4.20 PCB STORAGE AREA

4.20.1 Information Summary

Unit Description: This active PCB storage area is located on the west end of the facility property, adjacent to the hazardous waste storage area (Unit 4.18) (Figure 6). This unit is shown in Photograph 101 in Appendix A. This area is used for temporary storage of 55-gallon drums of PCB-contaminated wastes.(25)

The unit is approximately 160 sq ft in area and divided into two sections, each approximately 8 ft x 10 ft. The storage area is concrete paved and surrounded by a six-inch high, 4-inch wide concrete curb. Both the pavement and curb are coated with an epoxy resin. The area is partially enclosed, covered with a corrugated metal roof and metal siding along the east edge. A locked 12-foot high chain-link fence surrounds the entire area. The two sections are separated by the concrete curb and chain-linked fence. A concrete ramp in front of the gates allows fork lift access for drum loading. (25)

Date of Startup: This storage area was placed into service in 1982.(21)

Date of Closure: The PCB storage area is an active unit. (25)

Wastes Managed: The types of wastes stored in this area include trash contaminated with PCBs, oils with a PCB content greater 50 ppm, and empty capacitors. These wastes are stored in covered drums. At the time of the VSI, there were four drums present in this area.(25)

Release Controls: The concrete pavement and concrete curb are coated with an epoxy resin.

History of Releases: There is no file record of releases from this unit. No evidence of releases was observed during the VSI. The concrete pavement and curbing were in good condition. The drums also appeared to be in good condition. (25)

4.20.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater is low based on the containment of the wastes in drums and on the coated, concrete pavement and curbing providing additional release controls.

Surface Water Release Potential: There is a low potential for past and ongoing surface water releases from this unit based on the containment of the wastes in drums and on the coated, concrete pavement and curbing providing additional release controls.

Air Release Potential: The potential for release to air, both past and ongoing, is low based on the containment of the wastes in covered drums.

Subsurface Gas Release Potential: Based on the types of waste managed in this unit, and the location of wastes in a concrete area, there is no potential for the generation of subsurface gas.

4.21 GROSS OIL SEPARATOR (Unit "U")

4.21.1 Information Summary

Unit Description: This oil separator is located in the central portion of the facility (Figure 7) and is designated as Unit "U" in facility correspondence. (1,2,18) This unit is shown in Photographs 146 to 149. Process wastewater, tank drainage, and contaminated surface runoff from the Light Oil Processing and Operations Central areas are routed to the gross oil separator (GOS) for preliminary separation of oil from the wastewater.(17,18) This partially treated wastewater is then routed to the main wastewater treatment system.(18)

The gross oil separator has a capacity of 44,000 gallons and provides a settling time of 20 minutes.(18) The separator is a subgrade unit constructed of concrete and is equipped with an oil baffle and oil skimmer to retain and remove floatable oil.(18) A bar screen, located at the influent end of the separator, was originally designed to remove debris, although Shell has indicated that the bar screen is not used for this purpose.(25) A sump at the effluent end of the separator collects treated wastewater. The bar screen and sump are structurally integrated components of the separator.(18)

Oils removed in the separator are returned to the Crude Unit for reprocessing.(18) Separator effluent overflows a weir to the sump where it is pumped to the process sewer, combined with other process waste streams, and routed to the API separator (Unit 4.26).(17,18) Solids settling in the separator are removed approximately once per year by contractor-owned vacuum trucks and transported to an approved offsite disposal facility.(25)

Date of Startup: The GOS unit was placed into service in 1966.(25)

Date of Closure: This separator is an active unit. (25)

Wastes Managed: The unit receives hydrocarbon-contaminated wastewater from process areas.(18) Although chemical analyses of these wastewaters were unavailable for this review, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The separator is covered with concrete slabs.(25) The sump is equipped with a level-controlled 1500 gallon per minute pump which discharges effluent to the process sewer.(17) Initially, the separator was designed with a second pump to discharge overflow to a stormwater retention pond (Unit 4.61) located in the facility's east watershed.(17) Shell has indicated, however, that the overflow is no longer discharged to the stormwater pond.(25)

History of Releases: There was no file record of releases from this unit. No evidence of releases was observed during the VSI.(25) Due to the unit's subgrade construction and its active operational status, the structural integrity of the separator could not be evaluated at the time of the VSI.

4.21.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater due to overflow from the unit is low based on the level-controlled pump which routes effluent to the wastewater treatment system. The potential for soil and groundwater releases due to leakage from the unit cannot be evaluated since the structural integrity of the GOS unit could not be verified during the VSI.

<u>Surface Water Release Potential</u>: There is a low potential for past and ongoing releases to surface water as potential overflow from this unit is controlled by the level-controlled pump.

<u>Air Release Potential</u>: The air release potential, both past and ongoing, is low since the separator is covered with concrete slabs.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas due to overflow from this unit is low based on the effluent discharge controls. The potential for the generation of subsurface gas due to leakage from the unit cannot be evaluated since the structural integrity of the GOS could not be verified during the VSI.

4.22 CORRUGATED PLATE INTERCEPTOR (Unit "TT")

4.22.1 Information Summary

Unit Description: This unit is located in the western portion of the facility (Figure 7) and is designated as Unit "TT" in facility correspondence.(1,2,18) This unit is shown in Photographs 78, 79, 80,81, and 84 in Appendix A. Process waste streams from the east watershed are routed to the corrugated plate interceptor (CPI) for preliminary treatment.(18) The CPI provides an initial oil/water separation before the wastewater is treated in the main wastewater treatment system.(18)

The CPI is a subgrade concrete structure divided into two separator bays. Each separator bay was originally designed with two packs of corrugated plates mounted at a 45 degree angle to allow for separation of the free-floating oils from the wastewater to the surface of the unit and settling of suspended solids to the bottom of the unit.(18) The corrugated plates have since been removed from the bays; the unit now operates as a large oil/water skimming and settling tank.(25)

Wastewater enters the CPI through a trash screen (Unit 4.23), which removes debris. The debris is removed from the trash screen and collected in a waste bin (Unit 4.23). Solids settling on the bottom of the CPI are continuously pumped out and collected in one of three dumpster boxes (Unit 4.24). Floatable oils are skimmed from the CPI, collected in a recovered oil sump, and eventually recycled back to the Crude Unit. Treated effluent is combined with other waste streams and discharged to the API separator (Unit 4.26).(18,25)

Date of Startup: The CPI was placed into service in 1982-1983.(25)

Date of Closure: This is an active unit. (25)

<u>Wastes Managed</u>: The unit receives hydrocarbon-contaminated wastewater from process areas.(18) Although chemical analyses of these wastewaters were unavailable for this review, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: Discharge from the unit is controlled by a weir and level-controlled pumps. The unit is covered with metal plates. A process sewer drain surrounds the entire unit.(25)

History of Releases: There is no file record of releases from this unit. During the VSI, the metal plate covers and pavement surrounding the unit were heavily stained with oil. Due to the unit's subgrade construction and its active operational status, the structural integrity of the CPI could not be evaluated at the time of the VSI.

4.22.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater due to overflow from the unit is low based on the unit's operating conditions, effluent discharge controls, and process sewer drains surrounding the CPI. The potential for soil and groundwater releases due to leakage from the unit cannot be evaluated since the structural integrity of the CPI could not be verified during the VSI.

<u>Surface Water Release Potential</u>: Based on the unit's operating conditions, effluent discharge controls, and process sewer drains surrounding the CPI, there is a low potential for past and ongoing releases to surface water due to overflow.

Air Release Potential: The air release potential, both past and ongoing, is low as the unit is covered with metal plates.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas as a result of overflow from the unit is low based on the unit's operating conditions, effluent discharge controls, and process sewer drains surrounding the CPI. The potential for the generation of subsurface gas as a result of leakage from the unit cannot be evaluated since the structural integrity of the CPI could not be verified during the VSI.

4.23 CPI TRASH SCREEN AND WASTE BIN

4.23.1 Information Summary

Unit Description: The trash screen and waste bin are located above the corrugated plate interceptor (CPI) (Unit 4.22) in the western portion of the facility property (Figure 7).(18) This unit is shown is Photographs 82, 83, and 84 in Appendix A. The trash screen removes debris from the influent wastewater in the CPI. Debris collected on the trash screen is removed by a mechanical rake operated automatically by a timer once every 24 hours.(18,25) The debris is raked into a waste bin for temporary storage prior to recycling back into the refining processes.(25)

The trash screen and waste bin are situated on the metal cover of the CPI unit at its influent (south) end. The trash screen is an enclosed unit except for a hopper which discharges debris into the waste bin situated below the hopper. The waste bin is a metal semicircular open unit with a capacity of approximately 35 cubic feet.(25)

Date of Startup: The trash screen and waste bin were placed into service in 1983.(25)

Date of Closure: These are active units.(25)

<u>Wastes Managed</u>: The trash screens were designed to capture particles greater than 0.5 inches in diameter.(18) These solids are contaminated with the hydrocarbons found in the influent wastewater.(25) Although chemical analyses of this debris were unavailable for this review, these solids are expected to contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: These units are located adjacent to the process sewer drains that surround the CPI.(25) These sewers would catch any overflow from the unit.

<u>History of Releases</u>: There was no file record of releases from this unit. The area surrounding the trash screen and waste bin were heavily stained with oil at the time of the VSI, although it is unknown if these releases are attributed to these units or the CPI unit.

4.23.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater from both units is low based on the unit's location above the CPI and adjacent to the process sewer drains, both of which could collect any spillage or overflow.

Surface Water Release Potential: The potential for releases, both past and ongoing, to surface waters from these units is low based on the unit's location above the CPI and adjacent to the process sewer drains, both of which could collect any spillage or overflow.

Air Release Potential: The air release potential, both past and ongoing, from the trash screen is low since it is an enclosed unit. There is a past and ongoing potential for air releases of volatile components in the waste from the waste bin as it is an open unit.

Subsurface Gas Release Potential: There is no potential for the generation of subsurface gas from these units due to their location above the CPI unit.

4.24 CPI DUMPSTER BOXES

4.24.1 Information Summary

Unit Description: There are three dumpster boxes located adjacent to the CPI unit (Unit 4.22) in the western portion of the facility property (Figure 7).(25) These units are shown is Photographs 85 to 91 in Appendix A. The dumpsters are 20-yard portable bins.(25)

Sludge and solids that have settled to the bottom of the CPI unit are continuously pumped from the CPI into the dumpsters. The dumpsters serve as decant tanks, providing additional separation of water from the solids. Decant is routed back into the CPI. The separated solids, consisting mainly of coke, are returned for reprocessing in the refining operations.(25)

Date of Startup: The dumpsters became active in 1983.(25)

Date of Closure: The dumpster boxes are active units. (25)

<u>Wastes Managed</u>: Settled solids and sludges in the CPI are pumped to this unit for additional separation of water and solids. The solids consist mainly of a coke material.(25) Separated water is likely to contain the same hydrocarbon constituents found in the influent to the CPI.

Release Controls: Only one of the dumpsters is covered. The area beneath the dumpsters is concrete paved. The process sewer drain surrounding the CPI unit is also adjacent to the dumpsters.(25)

History of Releases: There was no file record of releases from this unit. The dumpsters appeared to be in good condition at the time of the VSI. Oil stains were noted on the outside of the dumpsters and on the pavement below the dumpsters. (25)

4.24.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and present releases to soil and groundwater is low based on the concrete pavement in good condition beneath the dumpsters and adjacent process sewer drains, which could collect any spillage or overflow.

<u>Surface Water Release Potential</u>: There is a low potential for past and ongoing releases to surface water from this unit based on the concrete pavement and adjacent process sewer drains, which could collect any spillage or overflow.

Air Release Potential: There is a moderate past and ongoing potential for air releases of volatile components in the wastes from the two uncovered dumpsters.

Subsurface Gas Release Potential: There is no potential for the generation of subsurface gas from this unit due to the above-ground location of the dumpsters, concrete pavement, and adjacent process sewer drains, which could collect any spillage or overflow.

4.25 API SEPARATOR BAR SCREEN AND TRASH BIN

4.25.1 Information Summary

Unit Description: These bar screen and trash bin units are located at the influent end (west end) of the API separator (Unit 4.26) on the northwest end of the facility property (Figure 3). These units are shown in Photographs 154 and 155 in Appendix A. The bar screen removes debris from the influent wastewater of the API separator. The bar screen is automatically cleaned and the debris is collected in the trash bin located below the bar screen. The liquid portion of the waste collected in the trash bin is pumped back into the API separator and the solid wastes are transferred to the hazardous waste storage bin at the waste transfer station (Unit 4.19).(25)

The bar screen itself is subgrade, consistent with the subgrade construction of the API separator. The raking mechanism of the bar screen unit and trash bin are above-grade units, located directly above the subgrade API separator influent channel. The waste bin is a metal semicircular open unit with a capacity of approximately 25 cubic feet. (25)

Date of Startup: The startup dates of these units are unknown.

Date of Closure: Both units are currently in operation. (25)

Wastes Managed: The wastes collected by the bar screen are contaminated with the hydrocarbons found in the influent wastewater. (25) Although chemical analyses of this debris were unavailable for this review, these solids are expected to contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: The units are located in an unpaved, unbermed area. Both units are open to the atmosphere.(25)

History of Releases: There was no file evidence of releases from these units. At the time of the VSI, oil stains were noted on the soil around the units. (25)

4.25.2 Conclusions

Soil/Groundwater Release Potential: Past releases to the soil have occurred from these units as evidenced by the oil-stained soil. There is an ongoing

potential for releases to soil from these units due to spillage as the area beneath the units is unpaved. The potential for past and ongoing releases to groundwater is low based on the location of these units directly above the subgrade API separator influent channel.

Surface Water Release Potential: These units are located in the vicinity of the wastewater treatment system surface impoundments and drainage patterns in this area are directed to these impoundments. As a result, there is a low past and ongoing potential for releases to surface water from these units.

Air Release Potential: There is a past and ongoing potential for air releases of volatile components in the waste from these units as they are open to the atmosphere.

Subsurface Gas Release Potential: There is no potential for the past or ongoing generation of subsurface gas from these units based on their location directly above the subgrade API separator influent channel.

4.26 API SEPARATOR (Unit "E")

4.26.1 Information Summary

Unit Description: This unit is located in the northwest corner of the facility property (Figure 3) and shown in Photographs 156 and 157 in Appendix A.(2,25) The API separator is designated as Unit "E" in facility corrrespondence.(1,2,18) The API separator is the first main component of the facility's wastewater treatment system and receives approximately one-third of all wastewaters generated at the refinery. The wastewater discharged to the API separator is oily wastewater from the light oil and heavy oil process area sewers, stormwater retention ponds, the gross oil separator (Unit 4.21), and the corrugated plate interceptor (Unit 4.22). The remaining two-thirds of the refinery wastewater is essentially oil-free and is generated from process areas, boiler blowdown, and cooling tower blowdown. This oil-free waste stream is discharged into the wastewater treatment system downstream of the API separator.(25)

The API separator is a subgrade unit, constructed with two parallel forebays, each with dimensions of 45 ft long x 18 ft wide x 6 ft deep, and two parallel afterbays, each with dimensions of 92 ft long x 18 ft wide x 6 ft deep.(31) The total design capacity of this unit is 7500 gallons per minute, although normal dry weather flows average 1500 gpm.(28,31) The unit was designed to provide slow velocity wastewater movement, allowing dispersed oil droplets to rise to the surface and settleable solids to settle to the bottom.(18) The separator is equipped with oil baffles and oil skimmers which provide continuous removal of the floating oils and scrapers to removed the settled solids.(18)

Oil skimmed from the API separator is routed to Tank 1064 (Unit 4.59) and eventually routed back to the Crude Unit for reprocessing.(25) The solids and water mixture accumulating on the bottom of the separator are continuously pumped into one of three sand boxes or waste bins (Unit 4.27) where the solids settle to the bottom and the water flows by gravity back to the API separator.(18,25) The solids in the sand box are periodically removed by vacuum truck to an offsite disposal site.(18,25) Effluent from the API separator is routed to a flash mixer/pH adjustment unit (Unit 4.29) for additional treatment.(18)

Date of Startup: The API separator was placed into service in about 1962.(25)

Date of Closure: This API separator is an active unit. (25)

<u>Wastes Managed</u>: The unit receives oily wastewaters from within the refinery. These oily wastewaters are expected to contain 40 CFR 261, Appendix VIII constituents, typical of hydrocarbon-contaminated waste streams, although chemical analyses of these wastes were unavailable for this review. API separator sludges are a RCRA listed hazardous waste (KO51) under 40 CFR 261.32.

Release Controls: The API separator is covered with concrete slabs.(25) Effluent discharge from the API separator to the flash mixer/pH adjustment unit is controlled by weir. An overflow weir, adjacent to the discharge weir, is used during wet weather flows to route the overflow to the emergency wastewater holding ponds (Unit 4.33).(25)

History of Releases: There is no file record of releases from this unit. No evidence of releases from this unit was observed during the VSI. Due to the unit's subgrade construction and its active operational status, the structural integrity of the API separator could not be evaluated during the VSI.

4.26.2 Conclusions

Soil/Groundwater Release Potential: There is a low potential for past and ongoing releases to soil and groundwater due to overflow from this unit, based on the effluent discharge and overflow controls. The potential for soil and groundwater releases due to leakage from the unit cannot be evaluated since the structural integrity of the API separator could not be verified during the VSI.

Surface Water Release Potential: The potential for releases to surface water, both past and present, is low based on the unit's effluent discharge and overflow controls.

Air Release Potential: The air release potential, both past and ongoing, is low as the API separator is a covered unit.

Subsurface Gas Release Potential: The potential for the past and ongoing generation of subsurface gas due to overflow from this unit is low based on the effluent discharge and overflow controls. The potential for generation of subsurface gas due to leakage from the unit cannot be evaluated since the structural integrity of the API separator could not be verified during the VSI.

4.27 SAND BOXES (Unit "II")

4.27.1 Information Summary

Unit Description: The sand boxes are adjacent to the API separator (Unit 4.26), on the northwest end of the facility property (Figure 3) and are designated as Unit "II" in facility correspondence.(1,2,18) These units are shown in Photographs 158, 159, and 160. The sand boxes are actually waste bins that are used for the separation of the water and solid phases of the API separator bottom sludges. Separated water is recycled back to the API separator. Accumulated solids are periodically removed by vacuum truck for disposal at an approved offsite facility.(18,25)

The sand boxes are above-ground portable metal bins with a capacity of approximately 20 cubic yards. Two of the bins are operated in series, while the third bin is used as a standby unit for excess solids loading. (25)

Date of Startup: The sand boxes were placed into service in about 1984.(25)

Date of Closure: These sand boxes are active units. (25)

Wastes Managed: API separator bottom sludges are pumped to this unit for solids/water separation. Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typically of complex hydrocarbon wastes. API separator sludges are a RCRA listed hazardous waste (K051) under 40 CFR 261.32.

Release Controls: The two adjacent sand boxes operated in series are surrounded by an asphalt curb approximately 6 inches high, although the area within the curb is unpaved. The standby sand box is surrounded by a separate six-inch high asphalt curb, and the area within the curb is also unpaved. The influent lines to the sand boxes have a manual control valve to prevent overflow of the units. All three sand boxes are open to the atmosphere. (25)

History of Releases: There was no file record of releases from this unit. The sand boxes appeared to be in good condition at the time of the VSI. The inflow and outflow lines and connections appeared to be in good working

condition. Oily stains were noted during the VSI on the outside of all three sand boxes and on the soil within both of the curbed areas. No past releases were observed on the soils outside of the curbed areas. (25)

4.27.2 Conclusions

Soil/Groundwater Release Potential: The effluent discharge and overflow controls for these sand boxes reduce the potential for significant amounts of wastes being released to the soil and groundwater due to overflow conditions. However, there have been past releases of minor amounts of wastes to the soil within the curbed areas surrounding the sand boxes as evidenced by the oily stains noted during the VSI. There is an ongoing potential for minor releases such as spillage to soil within the curbed areas as these areas are unpaved. Outside of the curbed areas, there is a low potential for ongoing releases to the soil as spillage would be contained within the curb. The potential for past and ongoing releases to groundwater is low based on minor amounts of waste that could potentially be released from the sand boxes.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow is low based on the units' effluent discharge and overflow controls. The potential for past and ongoing surface water releases due to spillage is also low based on the curbs surrounding the sand boxes.

<u>Air Release Potential</u>: There is a moderate past and ongoing potential for air releases of the volatile components of the waste as the sand boxes are open to the atmosphere.

Subsurface Gas Release Potential: The potential for the past and ongoing generation of subsurface gas due to overflow conditions is low based on the units' effluent discharge and overflow controls.

4.28 CENTRIFUGE SYSTEM (Unit "F")

4.28.1 Information Summary

<u>Unit Description</u>: This unit is located in a building in the northwest corner of the facility property (Figure 3) and is designated as Unit "F" on facility correspondence. (1,2,18) This unit is shown in Photographs 161 and 162 in Appendix A. The centrifuge system consisted of three main elements: a shaker screen, primary centrifuge, and secondary centrifuge.(18)

Skimmed oil removed from the API separator was routed to the centrifuge system for separation of the oil and water fractions. Wastes entered the centrifuge unit through the shaker screen, which removed large sediments and solids, and were then routed to the primary centrifuge for further separation of solids and liquids.(18) Solids separated by the shaker screen and primary centrifuge dropped into a waste lugger and were periodically hauled offsite for disposal. (18) Liquid effluent from the primary centrifuge was mixed with makeup water and fed to the secondary centrifuge for additional separation.(18) The secondary centrifuge separated the remaining solids as a slurry stream, and produced a clear oil effluent and a water effluent.(18) The slurry stream and water were then routed to the dissolved air flotation unit (Unit 4.30).(18) The clear oil was a recovered oil routed to Tank 1064 (SWMU 4.59) for storage prior to reprocessing.(18)

Date of Startup: The centrifuge system was placed into service in 1962.(25)

Date of Closure: The operation of this centrifuge system discontinued in 1979, except for a brief, unsuccessful attempt to use the system is 1981.(25)

<u>Wastes Managed</u>: This unit handled oil/water emulsions removed from the API separator. Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typically of complex hydrocarbon wastes.

Release Controls: The centrifuge unit was equipped with a vent scrubber system to control atmospheric emissions of hydrocarbons.(18) The centrifuge system was located on the second floor in the wastewater treatment system operations building.(25)

History of Releases: There was no file record of releases from this unit.
Oil stains were noted on the concrete flooring beneath the primary and secondary centrifuges at the time of the VSI.

4.28.2 Conclusions

Soil/Groundwater Release Potential: There is no potential for past releases to soil and groundwater based on the unit's location within a building. There is no ongoing release potential to soil and groundwater as this system is no longer in service.

Surface Water Release Potential: There is no potential for past surface water releases based on the unit's location within a building. As this centrifuge system is no longer operational, there is no ongoing release potential to surface water.

Air Release Potential: The potential for past releases to air was low based on the vent scrubber system, which controlled hydrocarbon emissions to the atmosphere. There is no ongoing air release potential as this unit is inactive.

Subsurface Gas Release Potential: There was no potential for the past generation of subsurface gas due to the unit's location within a building. As this unit is no longer in service, there is no ongoing potential for the generation of subsurface gas.

4.29 FLASH MIXER/pH ADJUSTMENT UNIT (Unit "P")

4.29.1 Information Summary

Unit Description: This flash mixer/pH adjustment unit is located in the northwest corner of the facility property adjacent to the API separator (Figure 3) and is designated as Unit "P" in facility correspondence.(1,2,18) This unit is shown in Photographs 163 and 164 in Appendix A. This unit is one of the components of the wastewater treatment system and consists of two flash mix tanks and one floc growth tank.(31)

The two flash mix tanks are subgrade concrete tanks, each with a capacity of 6000 gallons, and are operated in series. The floc growth tank is also a subgrade concrete tank with a capacity of 24,000 gallons.(25,31) Wastewaters from the API separator enter the first flash mix tank of this unit and are agitated by mechanical mixers.(18) The wastewater flows under a weir from the first flash mix tank into the second flash mix tank, where caustic is added to raise the pH to between 10.2 and 10.5.(18,25,31) Wastewater in the second flash mix tank flows under a weir to the floc growth tank, where at a pH of 10.2 to 10.5, hydroxides of calcium and magnesium precipitate. The floc that forms enhances the operation of the dissolved air flotation (DAF) units (Unit 4.30). Wastewater then flows by gravity from the floc mix tank to the dissolved air flotation units.(18,25,31)

Date of Startup: This unit was placed into service in approximately 1962.(25)

Date of Closure: This flash mixer/pH adjustment system is an active unit. (25)

<u>Wastes Managed</u>: Partially treated wastewater from the API separator is discharged to this unit.(18,25) Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appéndix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: The flowrate into this unit is controlled at the API separator. The area surrounding the tanks is unpaved. The tanks are located between the two DAF units; this entire area is surrounded by a six-inch high soil berm. The tanks are open to the atmosphere. (25)

History of Releases: There is no file record of releases from this unit. There was no evidence of releases observed during the VSI. Due to the subgrade construction of the unit and its active operational status, the structural integrity of the flash mixer/pH adjustment unit could not be evaluated during the VSI.

4.29.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. The potential for past and ongoing releases to soil and groundwater due to leakage cannot be evaluated as the structural integrity of the unit could not be verified during the VSI.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation, flowrate controls, and berm surrounding the unit.

<u>Air Release Potential</u>: There is a moderate potential for past and ongoing air releases of volatile components in the waste as the tanks are open to the atmosphere.

Subsurface Gas Release Potential: The potential for the past and ongoing generation of subsurface gas as a result of overflow conditions is low based on the unit's operation and flowrate controls. The potential for the past and ongoing generation of subsurface gas due to leakage cannot be evaluated as the structural integrity of unit could not be verified during the VSI.

4.30 DISSOLVED AIR FLOTATION UNITS (Unit "HH")

4.30.1 Information Summary

<u>Unit Description</u>: The dissolved air flotation (DAF) units are located in the northwest corner of the facility (Figure 3) and are designated as Unit "HH" in facility correspondence.(1,2,18) These units are shown in Photographs 165, 166, and 167 in Appendix A. There are two circular DAF units in the facility's wastewater treatment system.(18)

The two DAF units are subgrade circular concrete tanks each with a capacity of 113,000 gallons (45 ft in diameter and 10 ft deep). Each unit is equipped with four 14 ft skimmer blades and a skim pit.(31) Normal dry weather flows through the unit average 3000 gpm, with wet weather flows averaging 5000 gpm.(28)

Wastewater from the floc growth tank (Unit 4.29) is mixed in the DAF units with clarified recycle water that has been pressurized with air at 50 to 60 psig.(18) Floc particles, which contain enmeshed oil droplets and suspended solids, attach themselves to the rising air bubbles and form a floc blanket on the surface.(18) The floc blanket is removed by rotating skimmers and routed to an oily floc skim pit which is an integrated part of the DAF units.(18,25) The oily floc collected in the skim pit is pumped to Tank 1065 (Unit 4.47) for storage awaiting incineration in the CO boilers (Unit 4.49).(18,25) Clarified wastewater overflows a weir into the recycle pump suction well, where a small portion of the water is used as recycle water and a larger portion gravity flows to a final pH adjustment tank (Unit 4.31).(18,25)

Date of Startup: The DAF units were placed into service around 1962.(25)

Date of Closure: These DAF units are active units. (25)

Wastes Managed: Wastewater from the flash mixer/pH adjustment unit (Unit 4.29) is discharged to the DAF units.(18) Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes. DAF float is a RCRA listed hazardous waste (K048) under 40 CFR 261.32.

Release Controls: The flowrate into this unit is controlled at the API separator. The area adjacent to the DAF units is unpaved although it is surrounded by a six-inch high soil berm. The units are open to the atmosphere. (25)

History of Releases: There is no file record of releases from this unit. There was no evidence of releases observed during the VSI. Due to the subgrade construction of the unit and its active operational status, the structural integrity of the DAF units could not be evaluated during the VSI.

4.30.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. The potential for past and ongoing releases to soil and groundwater due to leakage cannot be evaluated as the structural integrity of unit could not be verified during the VSI.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation, flowrate controls, and berm surrounding the unit.

Air Release Potential: There is a moderate potential for past and ongoing air releases of volatile components in the waste as the DAF units are open to the atmosphere.

Subsurface Gas Release Potential: The potential for the past and ongoing generation of subsurface gas as a result of overflow conditions is low based on the unit's operation and flowrate controls. The potential for the past and ongoing generation of subsurface gas due to leakage cannot be evaluated as the structural integrity of unit could not be verified during the VSI.

4.31 FINAL PH ADJUSTMENT UNIT

4.31.1 Information Summary

Unit Description: This final pH adjustment unit is located in the northwest corner of the facility property (Figure 3) and is a component of the facility's wastewater treatment system.(18) This unit is shown in Photographs 168 and 169 in Appendix A. This final pH adjustment unit is a subgrade concrete tank located adjacent to the biotreater equalization feed ponds (Unit 4.32).

This unit receives effluent from the DAF units (Unit 4.30).(18) In this unit, sulfuric acid is added to the wastewater to lower the influent pH to about 9.0. The wastewater is then discharged to the biotreater equalization feed ponds with eventual discharge into the activated sludge biotreater (Unit 4.34). Lowering the pH of the wastewater prior to discharge into the activated sludge biotreater is necessary to enhance biological treatment in this unit and to ensure that effluent NPDES permit requirements are met.(4,18,25) During extreme high flow conditions or shock loadings, discharge from this unit is bypassed to the emergency wastewater holding ponds (Unit 4.33).(25)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: This final pH adjustment tank is an active unit. (25)

Wastes Managed: This unit is used to adjust the pH of DAF unit effluent.(18) Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: The flowrate into this unit and preceding units is controlled at the API separator. The unit is partially covered with a metal grate and partially by a concrete slab.(25)

History of Releases: There is no file record of releases from this unit. There was no evidence of releases observed during the VSI. Due to the subgrade construction of the unit and its active operational status, the structural integrity of the final pH adjustment unit could not be evaluated during the VSI.

4.31.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. The potential for past and ongoing releases to soil and groundwater due to leakage cannot be evaluated as the structural integrity of unit could not be verified during the VSI.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

Air Release Potential: There is a low potential for past and ongoing air releases of volatile components in the waste as the final pH adjustment unit is partially covered.

Subsurface Gas Release Potential: The potential for the past and ongoing generation of subsurface gas as a result of overflow conditions is low based on the unit's operation and flowrate controls. The potential for the past and ongoing generation of subsurface gas due to leakage cannot be evaluated as the structural integrity of unit could not be verified during the VSI.

4.32 BIOTREATER EQUALIZATION FEED PONDS (Unit "D")

4.32.1 Information Summary

Unit Description: These two adjoining equalization ponds are located in the northwest corner of the facility property (Figure 3) and are components of the wastewater treatment system.(2) These ponds are also known as Ponds 3 and 4 and Unit "D" in facility correspondence.(1,2,18) This unit is shown in Photographs 170 and 171 in Appendix A. The ponds are designed to equalize flow and wastewater composition prior to discharge into the biotreater unit (Unit 4.34).(18)

These two subgrade adjoining ponds are actually one earthen pond separated by a short baffle.(25) Both ponds occupy a total surface area of approximately 1.6 acres and have an average depth of one foot.(27) The total capacity of the ponds is four million gallons operated at a 22-hour detention time with a 3000 gpm dry weather flow.(28) The ponds are also equipped with aerators.(25)

Date of Startup: Both ponds have been used since 1960 for flow equalization.
(1) From 1920 to 1960, they were used for wastewater treatment.(1)

Date of Closure: The ponds are active units. (25)

Wastes Managed: Wastewater from the final pH adjustment unit (Unit 4.31) is discharged to the ponds.(18) Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: antimony, barium, chromium, nickel, lead, selenium, silver, benzene, toluene, 2,4-dimethyl-phenol, naphthalene, and phenol.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, nickel, mercury, silver, benzene, toluene, chrysene, and naphthalene.(27)

Release Controls: The ponds are unlined and surrounded by earthen berms.

History of Releases: There is no file record of releases from the ponds. No evidence of releases was observed at the time of the VSI. Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.32.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. There is a potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay mude and groundwater depths range from about 10 to 14 feet.(30) Groundwater contamination by lead and hydrocarbons has been documented in this area, although no specific source has been identified.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

Air Release Potential: There is a high potential for past and ongoing air releases of the volatile components in the wastewater as these ponds are open, aerated units.

Subsurface Gas Release Potential: Although the pond is unlined, the conditions and events favoring the generation of subsurface gas are not likely to occur. As a result, there is a low past and ongoing potential for the generation of subsurface gas due to seepage from this unit.

4.33 EMERGENCY WASTEWATER HOLDING PONDS (Unit"C")

4.33.1 Information Summary

<u>Unit Description</u>: These two adjacent holding ponds are located in the north-west corner of the facility property (Figure 3) and are components of the wastewater treatment system.(2) These ponds are also known as Ponds 1 and 2 and Unit "C" in facility correspondence.(1,2,18) This unit is shown in Photographs 172, 173, and 174 in Appendix A.

These ponds serve as temporary wastewater storage ponds, receiving wastewater from the final pH adjustment unit (Unit 4.31) during high flow conditions or unusual influent conditions, such as high ammonia levels.(18,25) Wastewater in these holding ponds can either be discharged to the biotreater equalization feed ponds (Unit 4.32) or directly into the biotreater unit (Unit 4.34).(25)

The ponds are subgrade, unlined units partially separated by an earthen berm. The total capacity of the ponds is three million gallons.(25,28) The combined surface area of the ponds is approximately 1.2 acres. The average water depth in the ponds is 1.5 feet.(27) These ponds are not aerated.(25)

Date of Startup: The ponds have been used since 1960 as wastewater holding ponds.(1) From 1920 to 1960 the ponds were used for wastewater treatment.(1)

Date of Closure: These ponds are active units. (25)

Wastes Managed: The ponds temporarily store wastewaters discharged from the final pH adjustment unit.(25) Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: nickel, selenium, silver, toluene, aniline, 2,4-dimethylphenol, naphthalene, and phenol.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, selenium, silver, benzene, toluene, benzo(a)pyrene, chrysene, 2-chloronaphthalene, fluoranthene, and naphthalene.(27)

Release Controls: The ponds are unlined and surrounded by earthen berms.

History of Releases: There is no file record of releases from the ponds. No evidence of releases was observed at the time of the VSI. The banks of the ponds were heavily coated with oil from the water surface to point about three feet up the bank (Photograph 174).(25) Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.33.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. There is a potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay muds and groundwater depths range from about 10 to 14 feet. (30) Groundwater contamination has been documented in this area, although no specific source has been identified.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

Air Release Potential: Although these ponds are open to the atmosphere, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

Subsurface Gas Release Potential: Although the pond is unlined, the conditions and events favoring the generation of subsurface gas are not likely to occur. As a result, there is a low past and ongoing potential for the generation of subsurface gas due to seepage from this unit.

4.34 ACTIVATED SLUDGE BIOTREATER

4.34.1 Information Summary

Unit Description: This unit is located in the northwest corner of the facility property (Figure 3) and is a main component of the wastewater treatment system.(2) This unit is shown in Photographs 175, 176, and 177. Wastewater from the equalization ponds (Unit 4.32) and emergency holding ponds (Unit 4.33) are pumped to the biotreater, where aerobic biodegradation of the organic components of the wastewater occurs.(18) The biotreater, also known as Pond 7, is equipped with mechanical aerators to provide aeration and mixing of the unit contents. Treated effluent is discharged to the air flotation clarifiers (Unit 4.35).(18) Sludges and settled solids are periodically removed and pumped to the biosludge thickener unit (Unit 4.36).(18)

The activated sludge biotreater consists of a 3.8 million gallon earthen basin, approximately 374 ft long x 222 ft wide, with sloping sides.(31) The biotreater is equipped with 15 floating mechanical aerators, 10 at 75 horse-power and 5 at 100 horsepower, which provide dissolved oxygen levels of greater than 3 to 4 mg/L.(28,31) The unit is operated at a dry weather flow-rate of 3000 gpm and a detention time of approximately 22 hours. Removal efficiencies in this unit have consistently been greater than 90% BOD.(28)

Date of Startup: The biotreater became active in the early 1970's.(25)

Date of Closure: This activated sludge biotreater is an active unit. (25)

Wastes Managed: The biotreater receives wastewaters from the equalization ponds and emergency holding ponds.(18) Water samples were collected from the biotreater and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: cadmium, selenium, thallium, and phenol.(27)

Release Controls: The biotreater unit is unlined and surrounded by earthen berms.

History of Releases: There is no file record of releases from the ponds. No evidence of releases was observed at the time of the VSI. Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.34.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. There is a potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay muds and groundwater depths range from about 10 to 14 feet. (30) Groundwater contamination has been documented in this area, although no specific source has been identified.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

<u>Air Release Potential</u>: Although the biotreater is an open, aerated unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

Subsurface Gas Release Potential: Although the pond is unlined, the conditions and events favoring the generation of subsurface gas are not likely to occur. As a result, there is a low past and ongoing potential for the generation of subsurface gas due to seepage from this unit.

4.35 TWO-STAGE DISSOLVED AIR FLOTATION CLARIFIERS

4.35.1 Information Summary

Unit Description: There are three, two-stage air flotation clarifiers as part of the wastewater treatment system.(18) The unit is located on the northwest end of the facility property (Figure 3).(2) These units are shown in Photographs 178 to 182 in Appendix A. Wastewaters from the biotreater (Unit 4.34) are discharged to this unit for secondary clarification.(18,25) Effluent from these clarifiers is routed to the sand filter feed pond (Unit 4.38).(18)

The first-stage clarifier is an above-grade open concrete tank with an underflow baffle. Polymers are added to the wastewater at this stage to enhance the solids removal process. Underflow from the first-stage clarifier is discharged into the second-stage clarifier, an enclosed metal inverted cone-shaped tank. Within the second-stage clarifier, the wastewater is saturated with dissolved air and the solids float to the top of the tank. (25) Solids removed in this process are routed back to the biotreater unit. (25,28)

<u>Date of Startup</u>: Two of the clarifier units (north and south units) were placed into service in the early 1970's.(25) The third (middle) unit was installed in 1982 to provide additional treatment capacity.(28)

Date of Closure: These air flotation clarifiers are active units. (25)

<u>Wastes Managed</u>: The clarifiers receive effluent from the biotreater. Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: The second-stage clarifier tanks are situated on concrete pads. The area surrounding the first and second stage clarifiers is partially concrete paved. (25)

History of Releases: There is no file record of releases from this unit. No evidence of releases from these clarifiers was observed at the time of the VSI.

4.35.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater is low based on the design, operation, and flowrate controls of these clarifiers.

<u>Surface Water Release Potential</u>: There is a low potential for past and ongoing surface water releases based on the design, operation, and flowrate controls of these clarifiers.

Air Release Potential: There is no past and ongoing potential for releases to air from the second-stage clarifier units as they are enclosed tanks. Although the first-stage clarifier units are open tanks, there is a low potential for both past and ongoing air releases based on the low concentrations of the volatile organic compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: Based on the design, operation, and flow-rate controls of the clarifiers there is no potential for the generation of subsurface gas.

4.36 BIOTREATER SLUDGE THICKENER UNIT (Unit "GG")

4.36.1 Information Summary

Unit Description: This unit is located in the northwest corner of the facility property (Figure 3) and is a component of the wastewater treatment system.(2) The biotreater sludge thickener is also referred to as Unit "GG" in facility correspondence.(1,2,18) This unit is shown in Photographs 190 and 191 in Appendix A. Settled solids and sludges are pumped from the biotreater (Unit 4.34) to this unit for thickening.(18)

The biotreater sludge thickener is an above-grade metal flotation tank with a diameter of 29 feet and a depth of 6.17 feet at the side wall. (18,25) The unit is also equipped with rotating skimmer arms and rotating rake arms on the bottom of the tank.(18) Feed entering the unit is mixed with recycle water that has been partially saturated with air at 50 psig.(18) Solids in the feed stream attach to the air bubbles and rise to the surface of the tank, where they are removed by the skimmers. (18) For a period of time, thickened sludge was pumped to Tank 1197 (Unit 4.37) for temporary storage, prior to burning in the CO boilers (Unit 4.49).(25) Currently, thickened sludge is pumped to Tank 1065 (Unit 4.47) prior to CO boiler incineration.(25) Effluent from the thickener overflows a weir and is discharged to the biotreater or the sand filter feed pond (Unit 4.38) depending upon the concentration of total suspended solids (TSS) in the effluent.(18) Thickener effluent with a TSS concentration less than or equal to the TSS concentration of the air flotation clarifier effluent is routed to the sand filter feed pond; if greater, the thickener effluent is discharged to the biotreater. (18)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: This biotreater sludge thickener is an active unit. (25)

<u>Wastes Managed</u>: Settled solids and sludges from the biotreater are pumped to this unit for treatment.(18) Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

4.37 BIOSLUDGE STORAGE TANK 1197

4.37.1 Information Summary

Unit Description: This sludge storage tank is located in the northwest corner of the facility property (Figure 3) and is a component of the wastewater treatment system. (18) This tank is shown in Photographs 192 and 193 in Appendix A. This tank served as a temporary storage unit for sludges removed from the biotreater thickener unit (Unit 4.36). (18) Contents of the tank were then transferred to Tank 1065 (Unit 4.47) for eventual burning in the CO boilers (Unit 4.49). (18)

This tank is a welded closed cylinder, 21.25 feet in diameter and 32 feet in height, providing a capacity of 2000 bbls.(18,21) The unit is constructed of a four course carbon steel shell material; each course ranging in thickness from 0.187 to 0.25 inches.(21) The tank is unlined.(21) The tank is also aerated to maintain an aerobic microbial population.(18)

<u>Date of Startup</u>: The tank was constructed in 1977 and placed into service in 1978.(21)

Date of Closure: Recently, Tank 1197 became inactive. Sludges removed from the thickener unit are now transferred directly to Tank 1065 (Unit 4.47). Tank 1197 is now only used on a back-up basis when Tank 1065 is full.(25) At the time of the VSI, Tank 1197 was inactive.(25)

<u>Wastes Managed</u>: This unit stores biotreater thickener sludges.(18) Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbon wastes.

Release Controls: The tank is equipped with an exhaust vent.(25) The tank is situated on a concrete pad in an unpaved and unbermed area.(25)

History of Releases: There is no file record of releases from this unit. No evidence of releases was observed at the time of the VSI.(25)

4.37.2 Conclusions

Soil/Groundwater Release Potential: There is a low potential for past and ongoing releases to soil and groundwater from this tank based on its construction and operation as a standby unit.

Surface Water Release Potential: There is a low past and ongoing surface water release potential due to the unit's construction and operation as a standby unit.

Air Release Potential: This unit is vented to the atmosphere; therefore, there was a moderate potential for air releases from this tank. There is no ongoing air release potential as this unit is inactive.

Subsurface Gas Release Potential: Based upon the unit's aboveground construction, there is no potential for generation of subsurface gas from this unit.

4.38 SAND FILTER FEED POND

4.38.1 Information Summary

Unit Description: The sand filter feed pond is located in the northwest corner of the facility property (Figure 3) and is a component of the wastewater treatment system.(2) This pond is shown in Photographs 184, 185, and 186 in Appendix A. This feed pond, also known as Pond 5A, receives air flotation clarifier (Unit 4.35) effluent and serves as a flow equalization pond for the sand filters (Unit 4.39).(18) When the sand filters are not in use flow can be diverted from the sand filter feed pond to the final holding pond (Unit 4.40).(25)

This unit is a subgrade, earthen, unlined pond with a capacity of approximately one million gallons. The pond occupies approximately 0.5 acres and has an average depth of 4.6 feet.(27) The pond is aerated.(25) The sand filter feed pond is adjacent to the final holding pond; these two ponds are separated by an earthen berm.(25)

<u>Date of Startup</u>: The pond was placed into service as a sand filter feed pond in 1982. Prior to that time, the pond was used as a wastewater holding pond.(25)

Date of Closure: This pond is an active unit. (25)

Wastes Managed: The unit receives effluent from the air flotation clarifiers. (18) Water and sediment samples were collected from these ponds and analyzed for metals. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: chromium, nickel, lead, selenium, and silver.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, chromium, mercury, nickel, selenium, and silver.(27)

Release Controls: The earthen pond is unlined and surrounded by earthen berms.

History of Releases: There is no file record of releases from the ponds. No evidence of releases was observed at the time of the VSI. Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds

(Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.38.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. There is a potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay muds and groundwater depths range from about 10 to 14 feet. (30) Groundwater contamination has been documented in this area, although no specific source has been identified.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

<u>Air Release Potential</u>: Although this pond is an open aerated unit, there is a low potential for past and ongoing air releases based on the very low concentrations of the volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the very low concentrations of organic compounds in the wastewater.

4.39 SAND FILTERS

4.39.1 Information Summary

Unit Description: There are six sand filter cells located in the northwest corner of the facility property (Figure 3) used for wastewater treatment.(2) These sand filters are shown in Photographs 187, 188, and 189. Effluent from the sand filter feed pond (Unit 4.38) is pumped to the sand filters for suspended solids removal.(18) Clarified water gravity flows to the final holding pond (Unit 4.40) prior to discharge to the Carquinez Strait.(18,25) Filter backwash is returned to the biotreater (Unit 4.34).(18)

The sand filter is an above-grade steel unit consisting of six parallel cells, each with a surface area of 320 square feet. Bed depths are approximately 12 inches. The average flowrate through the filters is approximately 3500 gpm.(31) These sand filter units are not operated continuously. Since the inception of polymer addition in the two-stage dissolved air flotation clarifiers (Unit 4.35), additional suspended solids removal in the sand filters is not always necessary to achieve effluent discharge permit limits. As a result, the sand filters can be bypassed with discharge from the sand filter feed ponds going directly to the final holding pond.(25)

Date of Startup: The sand filter units were placed into service in 1983.(25)

<u>Date of Closure</u>: These sand filters are active units, although they were not in operation at the time of the VSI.(25)

<u>Wastes Managed</u>: The sand filters receive effluent from the sand filter feed ponds.(18) The wastewaters in the sand filter feed pond contained chromium, nickel, lead, selenium, and silver.(27)

Release Controls: The sand filter units are situated on a concrete pad. The area surrounding the unit is partially paved but not bermed. The units are open to the atmosphere. (25)

<u>History of Releases</u>: There is no file record of releases from this unit. The sand filter units were not operating at the time of the VSI. The units appeared to be in good condition with no indications of past releases observed.

(25)

4.39.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater is low based on the design and operation of the unit and on the concrete pad and pavement.

Surface Water Release Potential: The potential for past and ongoing surface water releases is low based on the design and operation of the unit.

Air Release Potential: Although the sand filter units are open to the atmosphere, there is a low potential for both past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: Based on the unit's above-grade construction and operation, there is no potential for the past or ongoing generation of subsurface gas.

4.40 FINAL HOLDING POND

4.40.1 <u>Information Summary</u>

Unit Description: The final holding pond is located in the northwest corner of the facility property (Figure 3) and is a component of the wastewater treatment system.(2) This pond is shown in Photographs 194, 195, and 196 in Appendix A. This holding pond, also known as Pond 5B, receives clarified effluent from the sand filters (Unit 4.39) or from the sand filter feed ponds (Unit 4.38).(18,25) This pond serves as a final settling basin before wastewater is discharged to the Carquinez Strait under NPDES Permit No. CA 0005789.(18)

This unit is a subgrade, earthen, unlined pond with a capacity of approximately two million gallons. The pond occupies approximately one acre and has an average depth of 4.6 feet.(27) The pond is not aerated.(25) The periods of discharge into the Carquinez Strait are governed by the strait water level fluctuations.(25)

Date of Startup: The pond was placed into service around 1982.(25)

Date of Closure: This pond is an active unit. (25)

Wastes Managed: The unit receives effluent from the sand filters or sand filter feed ponds. (25) Water and sediment samples were collected from this pond and analyzed for metals. One sediment sample was analyzed for volatile organics and base/neutral/acid organics. The analytical results of the waste-water indicated the presence of the following 40 CFR 261, Appendix VIII constituents: chromium, nickel, and silver. (27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, and selenium. Most of the volatile and BNA organics were undetected in the sediment sample. (27)

Release Controls: The pond is unlined and surrounded by earthen berms.

History of Releases: There is no file record of releases from the ponds. No evidence of releases was observed at the time of the VSI. Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.40.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and flowrate controls. There is a potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay muds and groundwater depths range from about 10 to 14 feet.(30) Groundwater contamination has been documented in this area, although no specific source has been identified.

Surface Water Release Potential: Direct discharges from this unit are NPDES regulated. The potential for past and ongoing surface water releases due to overflow conditions is low based on the unit's operation and flowrate controls.

Air Release Potential: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of the volatile compounds found in the wastewater.

Subsurface Gas Release Potential: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the very low concentrations of organic compounds found in the wastewater.

4.41 SULFIDE CAUSTIC FLASH POT

4.41.1 Information Summary

Unit Description: The sulfide caustic flash pot is a component of the spent caustic neutralizing system. The spent caustic neutralizing system collects and treats spent caustics from the Light Oil Processing and Operations Central areas prior to their discharge to the wastewater treatment system. (18) The purpose of the spent caustic neutralizing system is to neutralize and strip hydrogen sulfide from these wastewaters. (18)

The sulfide caustic flash pot is located in the south central portion of the facility property (Figure 8) and is also referred to as vessel, V-510.(2,18) This unit is shown in Photographs 131, 132, and 133 in Appendix A. This flash pot is a closed steel vessel with an approximate diameter of six feet. The flash pot occupies the same casing as the caustic knockout pot or Vessel V-511 (Unit 4.42), with the flash pot located directly above the knockout pot. The total height of both vessels is approximately 35 feet.(25)

Spent caustics generated in the processing of desulfurized C-3 and C-4 hydrocarbons and gasoline are routed to the sulfide caustic pot. In this unit the lighter hydrocarbons in the waste stream are flashed off to the Flare Header. The hydrocarbon-free caustic wastes are then drained to the caustic sump (Unit 4.43). During periods of excess flow or process upsets there is generally more gasoline in the wastewater, and the flash pot is operated in series with the caustic knock-out pot (Unit 4.42). The waste stream is routed from the flash pot to the caustic knock-out pot, where the gasoline in the wastewater is recovered and routed to the alkylation unit.(25)

Date of Startup: The flash pot was placed into service in 1966.(25)

Date of Closure: The sulfide caustic flash pot is an active unit. (25)

<u>Wastes Managed</u>: The unit receives hydrocarbon-contaminated caustic wastes from the process areas.(18) Chemical analyses of these wastes were not available for this review, although the wastes are likely to exhibit a high pH and contain 40 CFR 261, Appendix VIII constituents from the hydrocarbon components of the waste.

Release Controls: The flash pot is a closed vessel situated on a concrete pad. The area surrounding the vessel is concrete paved but not curbed. (25)

History of Releases: There is no file record of releases from this unit. The flash pot appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.41.2 Conclusions

<u>Soil/Groundwater Release Potential</u>: The potential for past and ongoing releases to soil and groundwater is low based on the construction and operation of the unit and on the concrete pad and pavement surrounding the unit.

<u>Surface Water Release Potential</u>: Based on the unit's construction and operation there is no potential for past and ongoing surface water releases from this unit.

Air Release Potential: There is no potential for past and ongoing releases to air based on the unit's construction as a closed vessel.

<u>Subsurface Gas Release Potential</u>: There is no potential for the past and ongoing generation of subsurface gas from this unit based on the construction and operation of the unit.

4.42 CAUSTIC KNOCK-OUT POT

4.42.1 Information Summary

<u>Unit Description</u>: This unit is located in the south central portion of the facility (Figure 8) and is also referred to as vessel, V-511.(2,18) This unit is shown in Photographs 130 and 133 in Appendix A. The caustic knock-out pot is a closed steel vessel with an approximate diameter of six feet. The caustic knockout pot occupies the same casing as the flash pot or Vessel V-510 (Unit 4.41), with the flash pot located directly above the knockout pot. The total height of both vessels is approximately 35 feet.(25)

This unit is a component of the spent caustic neutralizing system and is only used as a stand-by unit for the flash pot. During normal operating conditions, spent caustics generated in the processing of desulfurized C-3 and C-4 hydrocarbons and gasoline are routed to the sulfide caustic pot, where lighter hydrocarbons in the waste stream are flashed off to the Flare Header. During periods of excess flow or process upsets, there is generally more gasoline in the wastewater and the flash pot and knock-out pot are operated in series. The waste stream is routed from the flash pot to the caustic knock-out pot, where the gasoline in the wastewater is recovered and routed to the alkylation unit.(25) The caustic wastes are then routed to the caustic sump (Unit 4.43).(18,25)

Date of Startup: The knock-out pot was placed into service in 1966.(25)

<u>Date of Closure</u>: The knock-out pot is an active unit, although it is only used on a stand-by basis.(25)

Wastes Managed: The unit receives hydrocarbon-contaminated caustic wastes from the process areas.(18) Chemical analyses of these wastes were not available for this review, although the wastes are likely to exhibit a high pH and contain 40 CFR 261, Appendix VIII constituents from the hydrocarbon components of the waste.

Release Controls: The knock-out pot is a closed vessel situated on a concrete pad. The area surrounding the vessel is concrete paved but not curbed. (25)

History of Releases: There is no file record of releases from this unit. The knock-out pot appeared to be in good condition at the time of the VSI, with no evidence of past releases observed. (25)

4.42.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater is low based on the construction and operation of the unit and on the concrete pad and pavement surrounding the unit.

<u>Surface Water Release Potential</u>: Based on the unit's construction and operation there is no potential for past and ongoing surface water releases from this unit.

Air Release Potential: There is no potential for past and ongoing releases to air based on the unit's construction as a closed vessel.

Subsurface Gas Release Potential: There is no potential for the past and ongoing generation of subsurface gas from this unit based on the construction and operation of the unit.

4.43 CAUSTIC SUMP

4.43.1 Information Summary

Unit Description: This unit is located in the south central portion of the facility (Figure 8) and is a component of the spent caustic neutralization system. (2,18) The caustic sump is shown in Photographs 134, 135, and 136 in Appendix A. This subgrade concrete sump collects hydrocarbon-free caustics from the sulfide caustic flash pot (Unit 4.41) and the caustic knock out pot (Unit 4.42) via the caustic sewer. (25) Sump contents are then pumped to Tank 952 (Unit 4.44) for temporary storage awaiting treatment in the spent caustic neutralizer (Unit 4.45). (18)

Date of Startup: The caustic sump was placed into service in 1966.(25)

Date of Closure: This sump is an active unit. (25)

<u>Wastes Managed</u>: Caustic wastes from the flash pot and knock-out pot are collected in this sump.(18) Chemical analyses of these wastes were not available for this review, although the waste are likely to exhibit a high pH.

Release Controls: The sump is totally covered by concrete slabs and metal plates. The sump is located in the caustic storage area which is concrete paved and surrounded by a 12-inch high, six-inch wide concrete curb. A process sewer drain lies directly adjacent to the sump. The sump is equipped with a high-level alarm to indicate when the sump needs to be emptied. (25)

<u>History of Releases</u>: There is no file record of releases from this unit. Due to its subgrade construction, the structural integrity of the sump could not be evaluated at the time of the VSI. No evidence of past releases was observed at this time.(25)

4.43.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the concrete pavement and curb, the adjacent process sewer, and the high-level

alarm. The potential for past and ongoing releases to soil and groundwater due to leakage cannot be adequately evaluated as the structural integrity of the unit could not be verified during the VSI.

Surface Water Release Potential: Based on the concrete pavement and curb, the adjacent process sewer, and the high-level alarm, there is a very low potential for past and ongoing surface water releases from this unit.

Air Release Potential: There is no potential for past and ongoing releases to air as this sump is covered.

Subsurface Gas Release Potential: Based upon the inorganic nature of the wastes managed in this unit, there is no potential for the generation of subsurface gas from this unit.

4.44 SPENT CAUSTIC STORAGE TANK 952 (Unit "PP)

4.44.1 Information Summary

Unit Description: This tank is located in the south central portion of the facility property (Figure 8) and is a component of the spent caustic neutralizing system. (2,18) The tank is also referred as Unit "PP" in facility correspondence. (1,2,18) Tank 952 is shown in Photographs 137, 138, and 139 in Appendix A. The tank is used for temporary storage of caustic wastes received from the caustic sump (Unit 4.43). Tank contents are then routed to the spent caustic neutralizer (Unit 4.45) for treatment. (18)

This tank is a welded closed cylinder, 20.0 feet in diameter and 36 feet in height, and provides a capacity of 2019 bbls.(21) The unit is constructed of a six course carbon steel shell material; each course ranging in thickness from 0.19 to 0.25 inches.(21) The tank is unlined.(21)

<u>Date of Startup</u>: The tank was constructed in 1947 but has only been used for spent caustic storage since 1981.(25) From 1947 to 1981 the tank was used for storage of lubricating oils.(26)

Date of Closure: This tank is an active unit. (25)

Wastes Managed: Spent caustics are currently stored in this tank. (18) Chemical analyses of these waste were unavailable for this review, although the waste are likely to exhibit a high pH.

Release Controls: The unit is closed to the atmosphere.(21) The tank is situated on a concrete pad. A 12-inch high, six-inch wide concrete curb encompasses a 25 ft x 25 ft area around the tank. The area within the curb is concrete paved. A process sewer drain is also located with the curbed area.(25)

<u>History of Releases</u>: There is no file record of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.44.2 Conclusions

Soil/Groundwater Release Potential: Based on the tank's construction, the concrete pad, pavement, and curb, and the process sewer drain within the curbed area, there is a low potential for past and ongoing releases to soil and groundwater from this unit.

Surface Water Release Potential: There is a low potential for surface water releases, both past and ongoing, based on the unit's construction, the concrete pad, pavement, and curb, and the process sewer drain within the curbed area.

Air Release Potential: This unit is closed to the atmosphere, therefore, air releases, both past and ongoing, from this unit are unlikely.

<u>Subsurface Gas Release Potential</u>: Based upon the unit's aboveground construction and the inorganic nature of the waste managed, there is no potential for generation of subsurface gas from this unit.

4.45 SPENT CAUSTIC NEUTRALIZER (Unit "V")

4.45.1 Information Summary

Unit Description: This spent caustic neutralizer (SCN) is located in the south central portion of the facility property (Figure 8) and is the major component of the spent caustic neutralization system.(2,18) The SCN is also referred to as Unit "V" in facility correspondence.(1,2,18) This unit is shown in Photographs 140, 141, 142, and 143 in Appendix A. The SCN unit is an above-grade vertical steel closed column. The column is approximately 3 ft in diameter and 25 ft high.(25)

Caustic wastes from Tank 952 (Unit 4.44) are pumped to the SCN feed manifold, where dilution water and sulfuric acid is added to the caustics.(18) Within the SCN, sulfides are stripped from the wastes and vented to a sour water stripper air cooler.(18) The neutralized, stripped caustic is cooled with quench water prior to discharge to the wastewater treatment system via the process sewer.(18)

Date of Startup: The SCN unit was placed into service in 1966.(25)

Date of Closure: The SCN is an active unit. (25)

Wastes Managed: Spent caustics are treated in this unit.(18) Chemical analyses of the wastes were unavailable for this review.

Release Controls: The area surrounding the unit is concrete paved but not curbed. A process sewer drain is located adjacent to the unit. (25)

History of Releases: There is no file record of releases from this unit. The unit appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.45.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater is low based on the unit's construction and operation, and on the concrete pavement and process sewer drain adjacent to the unit.

Surface Water Release Potential: Based on the unit's construction and operation, and on the process sewer drain adjacent to the unit, there is a low potential for past and ongoing surface water releases due to overflow or leakage from this unit.

Air Release Potential: There is no potential for past and ongoing releases to air based on the unit's closed construction.

Subsurface Gas Release Potential: Based upon the inorganic nature of the wastes managed in this unit, there is no potential for the generation of subsurface gas from this unit.

4.46 TANK 1068

4.46.1 Information Summary

Unit Description: Tank 1068 is located in the northwest portion of the facility property (Figure 5) and was referred to as Unit "JJ" in facility correspondence.(1,2,18) This surge tank was used to store spent caustic wastewaters prior to discharge to the spent caustic neutralizer unit (Unit 4.45). This tank is no longer used for this purpose, being replaced by Tank 952 (Unit 4.44). Tank 1068 is now used for the storage of a coke slurry byproduct that is recycled back into the coker process.(18,25)

Tank 1068 is an above-grade closed steel tank with an approximate diameter of 50 ft and a height of 30 ft.(25)

Date of Startup: Tank 1068 was placed into service in 1966.(25)

Date of Closure: From 1966 to May, 1981, the Tank 1068 was used for spent caustic storage. Since 1981, the tank has been used for coke slurry storage. (25)

<u>Wastes Managed</u>: Spent caustics generated from the Light Oil Processing area and Operations Central were discharged to this unit for storage. (18)

Release Controls: The tank is situated on an asphalt pad and surrounded by a 4-ft high earthen berm. The area within the berm is unpaved. (25)

History of Releases: There was no file record of releases from this tank. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed. Ponded storm water was observed within the bermed area at the time of the VSI.(25)

4.46.2 Conclusions

Soil/Groundwater Release Potential: During the period of use as a spent caustic storage tank, the potential for releases to soil and groundwater from the tank was low based on the unit's construction and asphalt pad. There is no ongoing potential for releases to soil and groundwater as this tank is no longer in service for spent caustic storage.

Surface Water Release Potential: The potential for releases to surface water during the period of use as a spent caustic storage tank, was low based on the unit's construction and berm surrounding the unit. There is no ongoing potential for releases to surface water as this tank is no longer in service for spent caustic storage.

Air Release Potential: There was no potential for air releases from this unit while it was in operation as a spent caustic storage tank, as the tank was a closed unit. There is no ongoing potential for releases to air as this tank is no longer in service for spent caustic storage.

Subsurface Gas Release Potential: During the period of use as a spent caustic storage tank, there was no potential for the generation of subsurface gas, based on the inorganic nature of the wastes stored. There is no ongoing potential for the generation of subsurface gas as this tank is no longer in service for spent caustic storage.

4.47 WASTE STORAGE TANK 1065 (Unit "G") (RCRA Regulated)

4.47.1 Information Summary

<u>Unit Description</u>: This waste storage tank is located in the northwest corner of the facility property (Figure 3) and is designated as Unit "G" in facility correspondence.(1,2,18) This tank is shown in Photographs 210, 213, and 214 in Appendix A.

This tank is a welded closed cylinder, 20.0 feet in diameter and 20.0 feet in height, and provides a capacity of 1137 bbls.(21) The unit is constructed of a four course carbon steel shell material; each course ranging in thickness from 0.195 to 0.27 inches.(21) The tank is unlined.(21)

Tank 1065 receives oily floc removed from the dissolved air flotation (DAF) units (Unit 4.30), and thickened biosludge from the sludge thickener unit (Unit 4.36) or Tank 1197 (Unit 4.37).(18,25) Approximately 30 wet tons per day of the DAF float and 100 wet tons per day of the thickened sludge are discharged into this tank.(25) The contents of Tank 1065 are pumped to Tank 383 (Unit 4.48) for holding prior to incineration in the CO boilers.(18,25)

Date of Startup: The tank was constructed in 1962, but has only been used since 1978 for oily floc and biosludge storage.(21) Prior to 1978, the tank was used for oil/water emulsion storage.(21)

Date of Closure: Tank 1065 is an active unit. (25)

Wastes Managed: Oily floc (DAF float) and biosludge are stored in this unit. DAF float is a RCRA listed hazardous waste (KO48) under 40 CFR 261.32. EP Toxicity analyses performed on these wastes showed the presence of chromium and selenium.(32) Chemical analyses of these wastes for volatile and semi-volatile organic compounds were unavailable for this review, although it is expected that these mixed wastes contain 40 CFR 261, Appendix VIII organic constituents typical of complex hydrocarbon wastes.

Release Controls: The tank is closed to the atmosphere. (21) The tank is situated on an asphalt pad and partially surrounded by a low earthen berm. The area surrounding the tank is unpaved. A process sewer inlet is located below the tank drain. (25)

History of Releases: There is no file record of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.47.2 Conclusions

Soil/Groundwater Release Potential: There is a low potential for past and ongoing releases to soil and groundwater based on the unit's construction, operation, concrete pad, and process sewer inlet adjacent to the tank.

<u>Surface Water Release Potential</u>: The potential for past and ongoing releases to surface water is low based on the unit's construction, operation, and adjacent process sewer inlet.

Air Release Potential: This unit is closed to the atmosphere, therefore, air releases, both past and ongoing, from this unit are unlikely.

Subsurface Gas Release Potential: Based upon the unit's aboveground construction, there is no potential for generation of subsurface gas from this unit.

4.48 WASTE STORAGE TANK 383 (Unit "S") (RCRA Regulated)

4.48.1 Information Summary

Unit Description: This tank is located in the south central portion of the facility property (Figure 8) and is designated as Unit "S" in facility correspondence.(1,2,18) Tank 383 is shown in Photographs 120, 121, and 122 in Appendix A. This tank receives sludges pumped from Tank 1065 (Unit 4.47).(18) The sludge is then pumped from Tank 383 through a strainer to the CO boilers (Unit 4.49).(18)

This tank is a riveted closed cylinder, 15.0 feet in diameter and 15.0 feet in height, and provides a capacity of 470 bbls.(21) The unit is constructed of a three course carbon steel shell material; each course ranging in thickness from 0.190 to 0.195 inches.(21) The tank bottom is 0.385 inches thick and lined with fiberglass reinforced plastic.(21)

Date of Startup: This tank was constructed in 1925, but has only been used since March 1982 for sludge storage. (26) Prior to 1982, the tank was used for the storage of lubricating oils. (26)

Date of Closure: Tank 383 is an active unit. (25)

Wastes Managed: Sludges and oily floc originating from the dissolved air flotation units, and biotreater are stored in this unit.(18) DAF float is a RCRA listed hazardous waste (K048) under 40 CFR 261.32. EP Toxicity analyses performed on these wastes showed the presence of chromium and selenium.(32) Chemical analyses of the wastes for volatile and semivolatile organics were not available for this review, although it is expected that these mixed wastes contain 40 CFR 261, Appendix VIII organic constituents, typical of complex hydrocarbons.

Release Controls: The tank is closed to the atmosphere. (21) Level-activated pumps control the discharge of wastewater from Tank 1065 to this tank. The tank is situated on a concrete pad. The area surrounding the tank is concrete paved but not curbed. A process sewer drain is adjacent to the tank. (25)

History of Releases: There is no file record of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed. (25)

4.48.2 Conclusions

Soil/Groundwater Release Potential: Based on the tank's construction, operation, and discharge controls, and on the concrete pavement and process sewer drain, there is a low past and ongoing release potential to soil and groundwater.

Surface Water Release Potential: There is a low potential for surface water releases, both past and ongoing, based on the unit's construction, operation, and discharge controls, and on the process drain adjacent to the tank.

Air Release Potential: This unit is closed to the atmosphere, therefore, air releases, both past and ongoing, from this unit are unlikely.

Subsurface Gas Release Potential: Based upon the unit's aboveground construction, there is no potential for generation of subsurface gas from this unit.

4.49 CO BOILERS (Unit "T") (RCRA Regulated)

4.49.1 Information Summary

<u>Unit Description</u>: There are three identical carbon monoxide (CO) boilers located in the south central portion of the facility property (Figure 8) and are referred to as Unit "T" in facility correspondence.(1,4,18) These units are shown in Photographs 123, 124, 125, and 126 in Appendix A.

The CO boilers were designed to use the heating ability of the flue gases from the Catalytic Cracking Unit's catalyst regeneration system to produce process steam for the refinery. (4,18) The boilers are operated under a Bay Area Air Quality Management District permit. (4,18) RCRA Part A and Part B permit applications have been submitted for this unit. (1)

The primary fuel for the CO boilers is the regenerator flue gas (CO) with a heating value of 350-450 BTU/lb.(4,18) Due to the presence of a high percentage of inert gases in the regenerator flue gas, it is necessary to burn an auxiliary fuel to maintain combustion temperatures.(4) Sludge from the dissolved air flotation units and biotreater of the wastewater treatment system is burned in the CO boilers for disposal and heat recovery.(4)

Each boiler unit is equipped with a forced-draft blower, stack, and electrostatic precipitator. (4) All three boilers are operated at similar conditions; incinerating sludge to produce carbon dioxide, water, and solid particulates. (4) The electrostatic precipitators remove particulates from the flue gas. (4) The particulates collected within the electrostatic precipitators are routed to an elevated dust storage hopper (Unit 4.50). (4) From 1966 until August 1987, the particulates in the dust storage hopper were emptied into a covered dumpster box (Unit 4.51) and transported to an offsite disposal facility. (25) Currently, particulates from the hopper are now collected in bags and temporarily stored onsite (Unit 4.52) prior to offsite disposal. (25)

Date of Startup: The units were placed into service in 1966.(25)

Date of Closure: These CO boilers are active units. (25)

<u>Wastes Managed</u>: In addition to burning wastewater treatment sludges, the CO boilers also burn H-2 plant sump water, machine shop sump water, and sulfinol reclaimer bottoms.(4) The characteristics and quantities of these five waste streams burned in the CO boilers are summarized as follows:(4)

- (1) Dissolved Air Flotation (DAF) Unit Floc The DAF floc is an oil/water emulsion removed from the top of the DAF unit and has a heating value of 1600 BTU/1b. This DAF floc is an EPA listed waste for chromium and lead (KO48). This waste also contains barium, nickel, and selenium, in addition to 40 CFR 261, Appendix VIII organic constituents. Thirty tons per day are burned in the CO boilers.
- (2) Waste Biosludge These biosludges are excess microbes removed from the biotreater and have a heating value of 650 BTU/lb. These contain barium, chromium, nickel, and silver; in addition to trace amounts of 40 CFR 261, Appendix VIII organic constituents. One hundred tons per day are burned in the CO boilers.
- (3) H-2 Plant Sump Water This wastewater is from equipment and floor washings in the H-2 Catalyst Plant and is contaminated with cobalt, nickel, and molybdenum. Seven hundred tons per year are treated in the CO boilers.
- (4) Machine Shop Sump Water This wastewater is from equipment washing in the machine shop and is contaminated with chromium. Two hundred tons per year are treated in the CO boilers.
- (5) Sulfinol Reclaimer Bottoms This stream is the heavy ends from the sulfinol reclaimer, and is predominantly oxyzolidone. The waste also contains barium, chromium, and nickel. One hundred tons per year are burned in the CO boilers.

Release Controls: Each boiler is equipped with an electrostatic precipitator to remove particulates from the flue gas. (4) The boiler units are mounted on concrete pads. The area surrounding the units is concrete paved but not curbed. There are process sewer drains adjacent to the boiler units. The boilers are inspected routinely by an independent insurance company. (25)

<u>History of Releases</u>: There is no file record of releases from this unit. The boiler units appeared to be well-maintained with no evidence of past releases observed.(25)

4.49.2 Conclusions

Soil/Groundwater Release Potential: Based on the design and operating characteristics of this unit, there is a very low potential for past and ongoing releases to soil and groundwater.

Surface Water Release Potential: The potential for past and ongoing surface water releases is low based on the unit's design and operating characteristics.

Air Release Potential: Based upon the unit's design and operating conditions, there is a high potential for air releases, past and present, of hazardous constituents. The extent of these releases is a function of the combustion efficiency of the boilers and the removal efficiency of the electrostatic precipitators.

<u>Subsurface Gas Release Potential</u>: Based upon the unit's design and operating characteristics, there is no potential for the generation of subsurface gas from this unit.

4.50 CO BOILERS DUST STORAGE HOPPER

4.50.1 <u>Information Summary</u>

Unit Description: This elevated dust storage hopper is located in the south central portion of the facility, adjacent to the CO boiler units (Figure 8).(25) The unit is shown in Photographs 127, 128, and 129 in Appendix A.

This dust storage hopper is used to collect CO boiler flue gas particulates removed in the electrostatic precipitators.(4) From 1966 until August 1987, the particulates in the dust storage hopper were emptied into a covered dumpster box (Unit 4.51) and transported to an offsite disposal facility.(25) Currently, particulates from the hopper are now collected in bags and temporarily stored onsite (Unit 4.52) prior to offsite disposal.(25)

The unit is an elevated metal hopper with an approximate capacity of 100 cubic yards.(25)

Date of Startup: The dust storage hopper was placed into service in 1966.(25)

Date of Closure: This dust storage hopper is an active unit. (25)

<u>Wastes Managed</u>: Particulates removed from the CO boiler flue gas are stored in this unit. These wastes were analyzed and found to contain arsenic, barium, chromium, lead, nickel, selenium, and thallium.(34)

Release Controls: The dust storage hopper is a covered unit. The area below the hopper is paved but not curbed. Process sewer drains are also located near the hopper.(25)

History of Releases: There is no file record of unintentional releases from this unit. The hopper appeared to be in good condition at the time of the VSI, with no evidence of past releases observed. There was relatively little dust in the area considering the nature of the operation. (25)

4.50.2 Conclusions

Soil/Groundwater Release Potential: There is a very low potential for past and ongoing releases to soil and groundwater based on the unit's construction and operation and on the pavement below the hopper.

Surface Water Release Potential: Based on the unit's construction and operation, and on the process sewer drains below the unit, there is a very low potential for past and ongoing surface water releases from this unit.

Air Release Potential: The potential for release to air, both past and ongoing, is low based on the unit's construction and operation.

Subsurface Gas Release Potential: Based on the inorganic nature of the wastes managed in this unit, there is no potential for the generation of subsurface gas from this unit.

4.51 CO BOILERS DUMPSTER BOX

4.51.1 Information Summary

Unit Description: This dumpster box received particulates transferred from the dust storage hopper (Unit 4.50) for storage prior to offsite disposal. (4, 25) The dumpster was located directly below the hopper unit in the south central portion of the facility, adjacent to the CO boiler units (Figure 8). (25) The dumpster was connected to the dust storage hopper and the discharge of the particulates was controlled with a valve. (25) The unit was taken out of service and removed from the site in August 1987. (25) As a result, the dumpster was not inspected during the VSI.

Date of Startup: The dumpster box was placed into service in 1966.(25)

Date of Closure: The dumpster box was taken out of service and removed from the site in August, 1987.(25)

<u>Wastes Managed</u>: Particulates removed from the CO boiler flue gas were stored in this unit. These wastes were analyzed and found to contain arsenic, barium, chromium, lead, nickel, selenium, and thallium.(34)

Release Controls: The dumpster was covered and vented to a baghouse air filter.(4) The area beneath the dumpster was paved but not curbed. Process sewer drains were also located near the unit.(25)

History of Releases: There is no file record of releases from this unit. No evidence of past releases was observed in the area formerly occupied by this unit at the time of the VSI.

4.51.2 Conclusions

Soil/Groundwater Release Potential: The potential for past releases to soil and groundwater was low based on the unit's construction and operation and on the pavement and process sewer drains surrounding the unit. There is no ongoing potential for soil and groundwater releases as this unit has been removed from the site.

<u>Surface Water Release Potential</u>: Based on the unit's construction and operation, and on the process sewer drains near the unit, there was a low potential for past releases to surface water. There is no ongoing potential for surface water releases as the unit has been removed from the site.

Air Release Potential: The potential for past releases to air was low based on the construction and operation of the unit. As this unit has been removed from the site, there is no ongoing release potential to air.

Subsurface Gas Release Potential: Based on the inorganic nature of wastes managed in this unit, there was no potential for the past generation of subsurface gas from this unit. This unit has been removed from the site, and as a result, there is no ongoing potential for the ongoing generation of subsurface gas.

4.52 CO BOILER DUST STORAGE AREA

4.52.1 Information Summary

Unit Description: This temporary dust storage area is located in the LOP area on the south end of the facility and is shown in Photographs 144 and 145 in Appendix A. Boiler particulates collected in the dust storage hopper (Unit 4.50) are transferred into bags. The bags are a high-strength plastic coated material, approximately 5 ft x 5 ft x 5 ft, and are connected directly to the bottom of the hopper. This bagging operation is essentially a dust-free operation and is shown in Photograph 129. When full, the bags are closed and hauled to the storage area by a forklift for temporary storage prior to offsite disposal at an approved facility. Approximately 35,000 to 40,000 pounds of the boiler fines are shipped offsite every two weeks. (25) At the time of the VSI, ten bags of the boiler fines were stored in this area. (25)

Date of Startup: This storage area was placed into service in August 1987.(25)

Date of Closure: This storage area is an active unit. (25)

<u>Wastes Managed</u>: Particulates removed from the CO boiler flue gas are collected in the hopper, transferred to bags, and stored in this unit. These wastes were analyzed and found to contain arsenic, barium, chromium, lead, nickel, selenium, and thallium.(34)

Release Controls: The bags are stored on pallets in an unpaved, unbermed, fenced area. The bags are also covered with plastic sheeting to protect the bags from rainwater. (25) Surface runoff in this area is collected in storm drains connected to the process sewer. The facility has plans to upgrade the storage area to include pavement, curbs, and a locked fence. (25)

History of Releases: There is no file record of releases from this unit. The bags appeared to be in good condition at the time of the VSI, with no evidence of past releases observed. (25)

4.52.2 Conclusions

Soil/Groundwater Release Potential: There is a potential for ongoing releases to soil and groundwater due to bag breakage or tears as the bags are located

in an unpaved and unbermed area. The bags however, are stored at this site for less than a two week period and this would tend to minimize the release potential. Since this unit has been in operation for less than six months and no evidence of past releases to soils were observed during the VSI, there is a low potential for past releases to soil and groundwater from this unit.

<u>Surface Water Release Potential</u>: Although the bags are located in an unpaved, unbermed area, there is a low potential for releases to surface water as storm drainage is collected in storm drains and routed to the process sewer.

Air Release Potential: There is a low potential for releases to air as the fines are stored in the bags.

Subsurface Gas Release Potential: There is no potential for the generation of subsurface gas from this unit, based upon the inorganic nature of the wastes managed in this unit.

4.53 INACTIVE ORGANIC CHLORIDE WASTE STORAGE TANK 881T

4.53.1 Information Summary

Unit Description: This inactive storage tank is located on the north end of the facility (Figure 7) and designated as Unit "SS" in facility correspondence.(1,2) Tank 881T is shown in Photographs 217, 218, 219, and 220 in Appendix A. The tank was used for the storage of organic chloride wastes prior to offsite shipment for reprocessing.(25)

This tank is a welded closed cylinder, 12.0 feet in diameter and 18.0 feet in height, and provides a capacity of 15,000 gals. The unit is constructed of a three course carbon steel shell material; each course ranging in thickness from 0.185 to 0.190 inches, and has a 0.18-inch thick carbon steel roof. The tank is unlined.(21)

Date of Startup: The tank was placed into service in 1965.(21)

Date of Closure: This tank was taken out of service and cleaned between 1983 and 1984.(25)

<u>Wastes Managed</u>: Allyl chloride wastes were stored in this tank.(25) Allyl chloride (chloropropene) is an Appendix VIII constituent.

Release Controls: Tank 881T is located in a tank storage area, surrounded by a four-foot high, six-inch wide concrete wall. The area within the wall is not paved. A process sewer inlet is located directly below the tank drain. (25)

History of Releases: There is no file record of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.53.2 Conclusions

Soil/Groundwater Release Potential: There was a low potential for past releases to soil and groundwater based on the tank construction and process sewer inlet below the tank drain. There is no ongoing potential for releases to soil and groundwater as this unit was taken out of service and cleaned.

Surface Water Release Potential: Based on the tank's construction and process sewer inlet below the tank drain, there was a low potential for surface water releases from the unit. There is no ongoing potential for releases to surface water as this tank is no longer in service.

Air Release Potential: There was a low potential for past air releases as this tank was a closed unit. As this tank is no longer in service, there is no ongoing air release potential.

Subsurface Gas Release Potential: Based on the tank's construction and above-ground location, there was a low potential for the past generation of subsurface gas from this unit. The tank is no longer in service, and as a result, there is no ongoing potential for the generation of subsurface gas.

4.54 WASTE STORAGE TANK 482 (Unit "BB")

4.54.1 Information Summary

Unit Description: This waste storage tank is located on the north end of the facility property, just north of Marina Vista Road (Figure 7) and is designated as Unit "BB" in facility correspondence.(1,2,18) This tank is shown in Photographs 224 and 225 in Appendix A. Tank 482 is used to store organic wastes generated from the RM-17 process prior to disposal in the incinerator (Unit 4.55).(4) Wastes are discharged into this tank on a batch basis, the frequency of discharge is a function of catalyst sales. The wastes are normally stored in this tank for an average of three to four days.(25)

This tank is a welded closed cylinder, 9.0 feet in diameter and 8.375 feet in height, and provides a capacity of 3995 gallons.(21) The unit is constructed of a one course carbon steel shell material, 0.250 inches in thickness and has a 0.188-inch thick carbon steel roof.(21) The tank is unlined.(21)

Date of Startup: This tank was constructed in 1968.(21)

Date of Closure: Tank 482 is an active unit.(25)

<u>Wastes Managed</u>: Organic wastes, originating from the RM-17 process area, are stored in this tank. These waste streams contain proprietary hydrocarbons, including toluene; and organo-phosphorus compounds.(4)

Release Controls: The tank is closed to the atmosphere. (21) The tank is mounted on a eight-inch thick concrete pad and is located in an open-sided building. The area surrounding the tank is concrete paved but not curbed. A process sewer drain is also located adjacent to the unit. (25)

History of Releases: There is no file record of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.54.2 Conclusions

Soil/Groundwater Release Potential: Based on the tank's construction, the concrete pad and pavement, and the floor drain adjacent to the unit, the potential for past and ongoing releases to soil and groundwater is low.

Surface Water Release Potential: There is a low potential for past and ongoing surface water releases based on the unit's construction and floor drain adjacent to the unit.

Air Release Potential: This unit is closed to the atmosphere, therefore, air releases, both past and ongoing, from this unit are unlikely.

Subsurface Gas Release Potential: Based upon the unit's aboveground construction, concrete pad and pavement, there is no potential for the past or ongoing generation of subsurface gas from this unit.

4.55 WASTE INCINERATOR (Unit "Z") (RCRA Regulated)

4.55.1 Information Summary

Unit Description: The waste incinerator is located on the north end of the facility property, just north of Marina Vista Road (Figure 7) and is designated as Unit "Z" and RM-17 in facility correspondence.(1,2) This unit is shown in Photographs 226, 227, 228, and 229 in Appendix A. RCRA Part A and B permits have been submitted for this unit.(4) The waste incinerator is designed to burn organic wastes generated from the RM-17 process operations. The incineration process is a batch operation, running continuously during RM-17 process operations.(4) These process operations are active only part of a year.(4)

The incinerator consists of a firebox, quench column, scrubbing train, and induced draft blower.(4) Wastes are incinerated in the firebox to carbon dioxide, water, and polyphosphates.(4) During the quench, the polyphosphates are condensed to orthophophates.(4) The scrubbing train is used to remove the orthophosphate from the flue gas.(4)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: The incinerator is an active unit. (25)

Wastes Managed: Incineration is a batch operation; hence, the waste streams vary in composition and generation rate.(4) However, the chemical and physical properties of the wastes are well established from knowledge of the process.(4) The waste streams contain proprietary hydrocarbons and organo-phosphorus compounds.(4) Toluene is the major organic hazardous constituent present in the incinerator feed.(4)

Release Controls: The scrubbing system is designed to remove particulates from the flue gas. (4) The area surrounding the unit is concrete paved. Process sewer drains are also located in the area. (25)

History of Releases: There is no file record of releases from this unit. The incinerator was not operating at the time of the VSI. There was no evidence of past releases observed from this unit. (25)

4.55.2 Conclusions

Soil/Groundwater Release Potential: There is a very low potential for past and ongoing releases based on the unit's design and operation.

Surface Water Release Potential: Based on the unit's design and operation, there is a low potential for past and ongoing surface water releases.

Air Release Potential: Based upon the unit's design and operating conditions, there is a high potential for air releases, past and present, of hazardous constituents. The extent of these releases is a function of the combustion efficiency of the incinerator and the removal efficiency of the scrubbing system.

Subsurface Gas Release Potential: Based upon the unit's design and operating characteristics, there is no potential for the past or ongoing generation of subsurface gas from this unit.

4.56 TWO ASD FILTER CAKE STORAGE BINS

4.56.1 Information Summary

Unit Description: There are two waste storage bins located on the north end of the facility property (Figure 7) and are designated as Unit "NN" in facility correspondence.(1,2) These storage bins are shown in Photographs 231 and 232 in Appendix A. The bins are portable, 10 cubic yard metal dumpsters with covers. The storage bins receive waste filter cake generated from process areas. The wastes are temporarily stored in this unit prior to offsite disposal at an approved facility.(25)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: These storage bins are active units.(25)

<u>Wastes Managed</u>: Several chemical analyses of the waste filter cake were performed. The filter cake was found to contain antimony, arsenic, barium, chromium, and nickel in concentrations below appropriate EPA Toxicity Limits and California TTLC limits.(35)

Release Controls: The bins are equipped with covers. The area surrounding the bins is concrete paved. Process sewer drains are also located in the area. (25)

<u>History of Releases</u>: There is no file record of releases from the bins. The bins appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.56.2 Conclusions

Soil/Groundwater Release Potential: There is a low past and ongoing potential for releases to soil and groundwater based on the concrete pavement and process sewer-drains in the area.

Surface Water Release Potential: Based on the unit's construction and process sewer drains in the area, there is a low potential for past and ongoing releases to surface water from the bins.

Air Release Potential: There is a low potential for past or ongoing air releases as the bins are equipped with covers.

Subsurface Gas Release Potential: Based on the unit's aboveground construction, concrete pavement, and nature of the wastes stored, there is no potential for the past and ongoing generation of subsurface gas from these bins.

4.57 PG&E SLUDGE TERRACES

4.57.1 Information Summary

Unit Description: The Pacific Gas and Electric Company (PG&E) leased a parcel of land from Shell Oil Co. and developed terraces for water treatment sludge drying and boiler blowdown evaporation. These sludge terraces are located on the south end of the facility (Figure 8) and are shown in Photographs 150, 151, and 152 in Appendix A. The site consists of three tiers occupying a total area of approximately one acre.

Date of Startup: The unit became active in 1966.(22)

Date of Closure: The terraces were taken out of service in 1984.(22)

Wastes Managed: The sludge was analyzed and found to have a pH ranging from 8.5 to 9.0 and contained arsenic, barium, cadium, chromium, nickel, selenium, and other metals.(22) Stormwater runoff was collected from the site, analyzed, and found to have a high pH and very low concentrations of soluble metals.(22)

Release Controls: The terraces were unlined and had no apparent containment system for storm runoff.(25)

History of Releases: There was no file evidence of releases from this unit. The site is monitored by a downgradient monitoring well. Analytical results of groundwater samples from this well have not indicated any releases from this site.(33) At the time of the VSI, waste sludges were still present in the terraces in a dry caked form and apparently stable. There was no evidence of offsite releases observed.(25)

4.57.2 Conclusions

Soil/Groundwater Release Potential: Based on the design and operation of the unit, there was a high potential for releases to soil from this unit. As the wastes are still present in the terraces, there is an ongoing potential for releases to soil. Based on the results of groundwater monitoring for this site, there is a low potential for past and ongoing releases to groundwater.

Surface Water Release Potential: There was a high potential for past releases to surface water via surface runoff from the site based on the design and operation of this unit. The wastes still remain at the site, and as a result, there is an ongoing potential for surface water releases. The surface water release potential, however, is reduced by the low solubility of metals in the surface runoff as evidenced by the sampling results.

Air Release Potential: Based on the types of wastes managed in this unit, there is a low past and ongoing potential for particulate releases to air.

Subsurface Gas Release Potential: There is no potential for the past or ongoing generation of subsurface gas from this unit based on the inorganic nature of wastes managed in this unit.

4.58 SPENT ACID STORAGE TANK 1218

4.58.1 Information Summary

Unit Description: This tank is located in the area of the wastewater treatment system on the northwest end of the facility property (Figure 3) and is designated as Unit "LL" in facility correspondence.(1,2) Tank 1218 is shown in Photographs 215 and 216 in Appendix A. This tank collects spent acids produced in the process areas. The spent acids are then used for pH adjustment in the wastewater treatment system.(25)

The tank is an above-grade closed steel tank with a diameter of approximately six feet and a height of ten feet. The tank is situated on a four-foot high concrete block. (25)

Date of Startup: The date of startup for this tank is unknown.

Date of Closure: The tank is an active unit. (25)

Wastes Managed: The tank collects spent sulfuric acids generated from the process areas.(25)

Release Controls: The area surrounding the tank is unpaved and uncurbed. A process sewer drain is adjacent to the tank. (25)

History of Releases: There is no file evidence of releases from this tank. The tank appeared to be in good condition at the time of the VSI. Some corrosion of the concrete block underneath the tank drain was noted. No other indications of past releases were observed.

4.58.2 Conclusions

Soil/Groundwater Release Potential: There is a low potential for past and ongoing releases to soil and groundwater based on the construction and operation of the tank.

Surface Water Release Potential: Based on the tank's construction and process sewer drains adjacent to the tank, there is a low potential for past and ongoing releases to surface water.

Air Release Potential: There is no potential for past or ongoing air releases as this tank is a closed unit.

Subsurface Gas Release Potential: Based on the inorganic nature of wastes managed in the tank, there is no potential for the past or ongoing generation of subsurface gas.

4.59 TANK 1064

4.59.1 Information Summary

Unit Description: Tank 1064 is located in the area of the wastewater treatment system on the northwest end of the facility (Figure 3) and is shown in Photograph 210 in Appendix A. The tank is an above-ground steel cylindrical unit with a diameter of approximately 20 feet and a height of 20 feet. (25)

Skimmed oils removed from the API separator (Unit 4.26) are routed to Tank 1064 for gravity separation of the water and oil fractions. Water separated from the oil is pumped back to the API separator. The "dry" oil is then pumped to Tank 1063 (Unit 4.60) for storage prior to reprocessing in the Crude Unit.(25)

Date of Startup: The tank was installed in 1966 and served as a surge tank for oils routed to the centrifuge system. In 1982, the tank was placed into its present service as a storage/separation tank for skimmed oil from the API separator. (25)

Date of Closure: This tank is an active unit. (25)

<u>Wastes Managed</u>: The tank receives oil skimmed from the API separator. Although chemical analyses of these wastes were unavailable for this review, it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typical of complex hydrocarbons.

Release Controls: The tank is a closed unit and is situated on an asphalt pad. The area surrounding the tank is unpaved and partially bermed with a six-inch high earthen berm. A process sewer drain is located directly below the tank drain.(25)

History of Releases: There is no file evidence of releases from this unit. The tank appeared to be in good condition at the time of the VSI, with no evidence of past releases observed.(25)

4.59.2 Conclusions

Soil/Groundwater Release Potential: Based on the tank's construction, operation, asphalt pad, and process sewer drain below the tank drain, there is a low potential for past and ongoing releases to soil and groundwater.

<u>Surface Water Release Potential</u>: There is a low past and ongoing release potential to surface water based on the unit's construction and process sewer drain below the tank drain.

Air Release Potential: There is no past or ongoing air release potential as the tank is a closed unit.

Subsurface Gas Release Potential: Based on the above-grade construction and asphalt pad below the tank, there is a low potential for the past or ongoing generation of subsurface gas from this unit.

4.60 TANK 1063

4.60.1 Information Summary

Unit Description: Tank 1063 is adjacent to the API separator, on the north-west end of the facility property (Figure 3).(2) This tank is shown in Photgraphs 210, 211, 212, and 214 in Appendix A.

Tank 1063 is an above-grade steel cylindrical tank with a diameter of 30 feet and a height of 40 feet and a capacity of 5029 barrels. The tank has a double sealed floating roof.(25)

Tank 1063 receives "dry" or separated oil from Tank 1064. Tank 1064 receives skimmed oil removed from the API separator where gravity separation of the water and oil fractions takes place. Water separated from the oil is pumped back to the API separator. The "dry" oil is then pumped to Tank 1063 for storage prior to reprocessing in the Crude Unit as a recovered oil.(25)

Date of Startup: Tank 1063 was placed into service in 1962.(25)

Date of Closure: This tank is an active unit. (25)

<u>Wastes Managed</u>: Chemical analyses of these wastes were unavailable for this review, although it is expected that these wastes contain 40 CFR 261, Appendix VIII constituents, typically of complex hydrocarbon wastes.

Release Controls: The tank is a closed unit and is situated on an asphalt pad. The area surrounding the tank is unpaved and partially bermed with a six-inch high earthen berm. A process sewer drain is located directly below the tank drain.(25)

History of Releases: There is no file evidence of releases from this unit. The tank appeared to be in good condition at the time of the VSI. Oil stains were noted in the process sewer drain and on the soil around the sewer drain. (25)

4.60.2 Conclusions

Soil/Groundwater Release Potential: Based on the tank's construction, operation, asphalt pad, and process sewer drain below the tank drain, there is a low potential for past and ongoing releases to soil and groundwater.

Surface Water Release Potential: There is a low past and ongoing release potential to surface water based on the unit's construction and process sewer drain below the tank drain.

Air Release Potential: There is no past or ongoing air release potential as the tank is a closed unit.

Subsurface Gas Release Potential: Based on the above-grade construction and asphalt pad below the tank, there is a low potential for the past or ongoing generation of subsurface gas from this unit.

4.61 UPPER LAKE SLOBODNIK (STORMWATER RETENTION POND)

4.61.1 Information Summary

Unit Description: This stormwater retention pond, known as Upper Lake Slobodnik, is one of four stormwater retention ponds located in the facility's east watershed. This unit is located in the north central portion of the facility (Figure 7) and is shown in Photographs 49, 50, and 51 in Appendix A.

Upper Lake Slobodnik is used as a holding pond for stormwater runoff from the Light Oil Processing area and tank farms. During dry weather periods, the contents of the pond are pumped to the wastewater treatment system for treatment.(25) After periods of extreme rainfall when the facility's stormwater holding and wastewater treatment system capacities are exceeded, wastewater from the pond can be discharged to the Carquinez Strait via a series of small sloughs, if NPDES permit limits are met.(27) This pond also has an overflow connection to Lower Lake Slobodnik (Unit 4.62).(25)

The pond has a surface area of 2.5 acres, an average depth of 3.8 feet, and a holding capacity of 3.7 million gallons.(27) The pond is unlined and equipped with an oil boom and level control weirs to retain settleable solids and flotable oils in the stormwater. Oils collected by the boom are routed back to the slop oil system for processing.(25)

Date of Startup: The exact startup date of this pond is unknown.

Date of Closure: This stormwater holding pond is an active unit. (25)

Wastes Managed: The pond collects hydrocarbon-contaminated wastewater from process areas.(18) Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: nickel, benzene, chloroform, and toluene.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, and selenium. Most of the volatile and BNA organic compounds in the sediment were undetected.(27)

Release Controls: The pond is an unlined unit, partially surrounded by earthen berms. (25)

History of Releases: There was no file record of releases from the pond. The pond is monitored by groundwater monitoring wells. Analytical results of groundwater samples from the wells have indicated that no releases have occurred from this site.(33) No evidence of overflow was observed during the VSI.(25)

4.61.2 Conclusions

Soil/Groundwater Release Potential: The potential for past and ongoing releases to soil and groundwater due to overflow conditions is low based on the unit's operation and overflow controls. There is a moderate potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined, although the results of the groundwater monitoring have indicated that no groundwater releases have occurred.

<u>Surface Water Release Potential</u>: The potential for past and ongoing surface water releases is low based on the unit's operation and overflow controls. Overflow discharges from this unit are NPDES regulated.

Air Release Potential: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of the volatile compounds found in the wastewater.

Subsurface Gas Release Potential: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the low concentrations of organic compounds in the wastewater.

4.62 LOWER LAKE SLOBODNIK (STORMWATER RETENTION POND)

4.62.1 Information Summary

Unit Description: This stormwater retention pond, known as Lower Lake Slobodnik, is located to the north of Upper Lake Slobodnik on the the facility's east watershed. This unit is located in the north central portion of the facility (Figure 7) and is shown in Photographs 52, 53, 54, and 55 in Appendix A. The pond has a surface area of 0.6 acres, an average depth of 2.5 feet, and a holding capacity of 0.8 million gallons.(27)

This stormwater retention pond collects drainage from areas directly adjacent to the pond. Water is discharged from the pond to Carquinez Strait via a series of sloughs when NPDES permit limits are met.(27)

Date of Startup: The startup date for this unit is unknown.

Date of Closure: This stormwater holding pond is an active unit. (25)

Wastes Managed: The pond collects stormwater runoff from areas surrounding the pond. Water and sediment samples were collected from this pond and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: chromium, nickel, silver, acetone, benzene, chloromethane, toluene, and phenol.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, and selenium. Most of the volatile and BNA organic compounds in the sediment were undetected.(27)

Release Controls: The pond is an unlined, unbermed unit. (25)

History of Releases: There was no file record of releases from this pond. The pond is monitored by groundwater monitoring wells. Analytical results of groundwater samples from the wells have indicated that no releases have occurred from this unit.(33) No evidence of overflow was observed during the VSI.(25)

4.62.2 Conclusions

Soil/Groundwater Release Potential: There is a moderate potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined, although the results of the groundwater monitoring have not indicated any groundwater releases.

Surface Water Release Potential: Discharges from this pond to surface waters are NPDES-regulated.

Air Release Potential: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the low concentrations of organic compounds found in the wastewater.

4.63 STORMWATER HOLDING POND

4.63.1 Information Summary

Unit Description: This stormwater holding pond is located on the northeast end of the facility, north of the wastewater treatment system (Figure 3). This pond is shown in Photographs 201, 202, 203, 204, and 205 in Appendix A.

This stormwater holding pond receives stormwater and process wastewater flows which exceed the treatment plant capacity during wet weather periods. During dry weather periods, the wastewater in the pond is routed back to the wastewater treatment system for treatment.(27)

The earthen pond has a surface area of 8.1 acres, an average depth of 2.5 feet, and a holding capacity of 15.7 million gallons.(27) The pond is unlined and equipped with an oil boom to retain floatable oils in the wastewater. Oils collected by the boom are routed back to the slop oil system for processing. (25)

Date of Startup: The startup date of this unit is unknown.

Date of Closure: This stormwater holding pond is an active unit. (25)

Wastes Managed: Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: nickel, selenium, silver, benzene, toluene, aniline, chrysene, 2,4-dimethylphenol, naphthalene, and phenol.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, selenium, silver, toluene, chrysene, naphthalene, and phenol.(27)

Release Controls: The pond is unlined and surrounded by an earthen berm. (25)

<u>History of Releases</u>: There is no file record of releases from this pond. No evidence of releases was observed at the time of the VSI. Groundwater samples collected from monitoring wells downgradient of the wastewater treatment ponds

(Unit 4.32, 4.33, 4.34, 4.38, 4.40, and 4.63) have shown an increase in the concentrations of lead, benzene, xylenes, and ethylbenzene compared with groundwater samples collected from upgradient wells.(33) Based on the types of wastes managed in these ponds, it is likely that more than one of the ponds has contributed as a source of these contaminants.

4.63.2 Conclusions

Soil/Groundwater Release Potential: There is a high potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined. The soils in this area are silty sand bay muds and groundwater depths range from about 6 to 14 feet. (30) Groundwater contamination has been documented in this area, although no specific source has been identified.

<u>Surface Water Release Potential</u>: There is a moderate potential for past and ongoing surface water releases due to overflow conditions based on proximity of this unit to the Carquinez Strait.

Air Release Potential: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the low concentrations of organic compounds found in the wastewater.

4.64 FLARE AREA STORMWATER HOLDING POND

4.64.1 <u>Information Summary</u>

<u>Unit Description</u>: This stormwater retention pond, known as the Flare Area Pond, is one of four stormwater retention ponds located on the facility's east watershed. This unit is located in the southeast portion of the facility (Figure 10).(27) This pond was not inspected during the VSI.

The pond has a surface area of 0.6 acres, an average depth of 1.4 feet, and a holding capacity of 0.8 million gallons.(27) This stormwater retention pond collects drainage from the flare area. Water is discharged from the pond to Carquinez Strait via a series of sloughs when NPDES permit limits are met.(27)

Date of Startup: The startup date for this unit is unknown.

Date of Closure: This stormwater holding pond is an active unit. (27)

Wastes Managed: The pond collects stormwater runoff from areas surrounding the pond. Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: lead and nickel. Most of the volatile and BNA organic compounds in the wastewater were undetected.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, and thallium. Most of the volatile and BNA organic compounds in the sediment were undetected.(27)

Release Controls: Release controls for this unit are unknown at this time. Based on information for other stormwater holding ponds at the facility, the pond is probably unlined.

History of Releases: There was no file record of unintentional releases from the ponds. The pond was not inspected at the time of the VSI.

4.64.2 Conclusions

Soil/Groundwater Release Potential: If this pond is unlined, there is a potential for past and ongoing releases to soil and groundwater due to

seepage. Additional information should be obtained regarding release controls for this unit in order to further evaluate the soil and groundwater release potential for this pond.

Surface Water Release Potential: Discharges from this pond to surface waters are NPDES-regulated.

<u>Air Release Potential</u>: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: Based on the low concentrations of organic compounds in the wastewater, there is a low potential for the past and ongoing generation of subsurface gas from this unit.

4.65 VINE HILL STORMWATER HOLDING POND

4.65.1 Information Summary

<u>Unit Description</u>: This stormwater retention pond, known as the Vine Hill Pond, is one of four stormwater retention ponds located on the the facility's east watershed. This unit is located in the southeast portion of the facility (Figure 10).(27) This pond was not inspected during the VSI.

The pond has a surface area of 0.6 acres, an average depth of 3.6 feet, and a holding capacity of 0.8 million gallons.(27) This stormwater retention pond collects storm drainage from eastern portion of the refinery. Water is discharged from the pond to Carquinez Strait via a series of sloughs when NPDES permit limits are met.(27)

Date of Startup: The startup date for this unit is unknown.

Date of Closure: This stormwater holding pond is an active unit. (27)

Wastes Managed: The pond collects stormwater runoff from areas surrounding the pond. Water and sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. The analytical results of the wastewater indicated the presence of the following 40 CFR 261, Appendix VIII constituents: nickel and silver. Most of the volatile and BNA organic compounds in the wastewater were undetected.(27) Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, nickel, and silver. Most of the volatile and BNA organic compounds in the sediment were undetected.(27)

Release Controls: Release controls for this unit are unknown at this time. Based on information for other stormwater holding ponds at the facility, the pond is probably unlined.

History of Releases: There was no file record of releases from the ponds. The pond was not inspected at the time of the VSI.

4.65.2 Conclusions

Soil/Groundwater Release Potential: If this pond is unlined, there is a potential for past and ongoing releases to soil and groundwater due to seepage. Additional information should be obtained regarding release controls for this unit in order to further evaluate the soil and groundwater release potential for this pond.

<u>Surface Water Release Potential</u>: <u>Discharges from this pond to surface waters</u> are NPDES-regulated.

<u>Air Release Potential</u>: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

<u>Subsurface Gas Release Potential</u>: Based on the low concentrations of organic compounds in the wastewater, there is a low potential for the past and ongoing generation of subsurface gas from this unit.

4.66 STORMWATER HOLDING PONDS (Formerly LTA "FF")

4.66.1 Information Summary

Unit Description: These stormwater holding ponds are located on the northeast end of the facility, northeast of the wastewater treatment system (Figure 5). These ponds are shown in Photographs 206, 207, 208, and 209 in Appendix A. These ponds were formerly land treatment area "FF", used as drying beds for wastewater treatment plant sludges (Unit 4.1).(25)

These stormwater holding ponds are used on a standby basis when the wastewater treatment plant stormwater holding pond (Unit 4.63) is near capacity. Wastewaters entering the ponds include stormwater and process wastewater flows during wet weather periods. During dry weather periods, the wastewater in the ponds is pumped back to the wastewater treatment system for treatment.(27)

The three ponds are unlined and separated by intermediate earthen dikes. The ponds have a combined surface area of 13.8 acres, and a total holding capacity of 26.8 million gallons.(27)

Date of Startup: The ponds have been active since 1985.(29)

Date of Closure: This stormwater holding pond is an active unit. (25)

Wastes Managed: Sediment samples were collected from these ponds and analyzed for metals, volatile organics, and base/neutral/acid organics. Analytical results of the sediment indicated the presence of the following 40 CFR 261, Appendix VIII constituents: arsenic, barium, chromium, lead, mercury, nickel, silver, and toluene.(27)

Release Controls: The ponds are unlined and surrounded by an earthen berm. (25)

History of Releases: There is no file record of releases from this pond. The pond is monitored by groundwater monitoring wells. Analytical results of groundwater samples from the wells have indicated that no releases have occurred from this unit.(33) At the time of the VSI, two of the ponds contained water. No evidence of overflow was observed during the VSI.(25)

4.66.2 Conclusions

Soil/Groundwater Release Potential: There is a high potential for past and ongoing releases to soil and groundwater due to seepage as this unit is unlined, although the results of the groundwater monitoring have indicated that no groundwater releases have occurred.

<u>Surface Water Release Potential</u>: There is a moderate potential for past and ongoing surface water releases due to overflow conditions based on proximity of this unit the the Carquinez Strait.

Air Release Potential: Although this pond is an open unit, there is a low potential for past and ongoing air releases based on the very low concentrations of volatile compounds found in the wastewater.

Subsurface Gas Release Potential: There is a low potential for the past and ongoing generation of subsurface gas due to seepage from this unit based on the low concentrations of organic compounds found in the wastewater.

4.67 INACTIVE UNIT "YY"

4.67.1 Information Summary

Unit Description: This inactive land disposal area is located in the north central portion of the facility within the tank berm area surrounding Tanks 8, 9, 10, and 12 (Figure 7). This site was used during the 1950's to dispose of sludges from the tanks. (29,30) This unit was not inspected during the VSI.

Information on the unit's construction, operation, and waste management practices were not available for this review.

Date of Startup: The unit operated during the 1950's.(29,30)

Date of Closure: The waste disposal site is no longer active. (29,30)

<u>Wastes Managed</u>: Tank sludges were disposed in this unit. The specific contents of the tanks and the types of sludges are unknown at this time.

Release Controls: The site is surrounded by six to eight-foot berms, which were believed to have been part of the original construction of the unit. (30)

History of Releases: Four soil borings were collected within this inactive waste disposal area as part of a waste site investigation conducted by Shell.(29) The borings ranged form 2.5 to 5.5 feet in depth and yielded six soil samples. Samples were analyzed for metals, chloride, sulfate, sulfide, pH, total organic halogens (TOX), and total petroleum hydrocarbons. The following 40 CFR 261, Appendix VIII constituents were detected in the soil samples: barium, chromium, lead, nickel, and thallium.(29) Based on the results of groundwater monitoring for this unit, it appears that no releases to groundwater have occurred as a result of the operation of this unit.(29,30)

4.67.2 Conclusions

Soil/Groundwater Release Potential: Based on the results of soil sampling it appears that soil releases may have occurred. There was no indication of past groundwater releases from this unit. There is a low ongoing potential for release to groundwater based on the existing soil contamination.

Surface Water Release Potential: Due to the lack of information on the unit's construction, operation, and waste management practices, the surface water release potential cannot be evaluated at this time.

Air Release Potential: The air release potential cannot be evaluated at this time due to the lack of information on the unit's construction, operation, and waste management practices.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas from this unit cannot be determined until information is obtained regarding the unit's construction, operation, waste management practices, and specific types of wastes disposed in this unit.

4.68 INACTIVE UNIT "ZZ"

4.68.1 Information Summary

Unit Description: This inactive land disposal area is located on the north end of the facility, north of Marina Vista Boulevard (Figure 7). This site was used as a railroad tank car cleaning area before Shell purchased the property in 1946.(29,30) Discharges to the unit occurred in the form of spillage of wastewater resulting from the tank car cleaning operations.(30) This unit was not inspected during the VSI.

Details on the specific tank cleaning procedures and waste handling practices are lacking.

Date of Startup: The unit operated prior to 1946.(29,30)

Date of Closure: The waste disposal site is no longer active. (29,30)

<u>Wastes Managed</u>: Tank car cleaning wastewaters were discharged into this unit. The specific contents of the tank cars and the types of cleaning solutions, if any, are unknown at this time.

Release Controls: There is no available information concerning release controls for this unit.

History of Releases: Six soil borings were collected within this inactive waste disposal area as part of a waste site investigation conducted by Shell.(29) The borings ranged form 5.0 to 15.0 feet in depth and yielded eight soil samples. Samples were analyzed for metals, chloride, sulfate, sulfide, pH, total organic halogens (TOX), and total petroleum hydrocarbons. The following 40 CFR 261, Appendix VIII constituents were detected in the soil samples: barium, chromium, lead, nickel, and thallium.(29) Based on the results of groundwater monitoring for this unit, it appears that no releases to groundwater have occurred as a result of the operation of this unit.(29,30)

4.68.2 Conclusions

Soil/Groundwater Release Potential: Based on the results of soil sampling it appears that soil releases may have occurred. There was no indication of past

groundwater releases from this unit. There is a low ongoing potential for release to groundwater based on the existing soil contamination.

<u>Surface Water Release Potential</u>: Due to the lack of information on the unit's operation and waste management practices, the surface water release potential cannot be evaluated at this time.

Air Release Potential: The air release potential cannot be evaluated at this time due to the lack of information on the unit's operation and waste management practices.

Subsurface Gas Release Potential: The potential for the generation of subsurface gas from this unit cannot be determined until information is obtained regarding the unit's operation, waste management practices, and specific types of wastes disposed in this unit.

5.0 CONCLUSIONS

A RCRA facility assessment (RFA) was performed to identify and evaluate solid waste management units (SWMUs) and other areas of concern at the Shell oil refinery in Martinez, California. The RFA utilizes records review, data evaluation, interviews, and a visual site inspection to evaluate the potential for releases of hazardous constituents from SWMUs identified during the assessment. The records review is based on information found in RCRA and CERCLA files of EPA Region 9, the facility's RCRA Part B permit application, files and reports of DOHS, and files and reports to the San Francisco Bay Region RWQCB. The visual site inspection was conducted November 11, 12, and 13, 1987.

The Shell Oil Martinez facility was established at this location in 1913 with a product terminal. In 1916, Shell commenced refining operations at this site, and in 1931, constructed a chemical plant for the production of secondary butyl alcohol. The facility currently maintains a crude-run throughput of 107,400 barrels per day, and manufactures various hydrocarbon products, gasoline additives, and catalysts. The facility has submitted a RCRA Part B permit application to operate a waste incinerator and three carbon monoxide boilers for waste disposal.

A total of 68 SWMUs were identified and evaluated at the Shell Oil facility in the course of this assessment. Most of these units were examined during the visual site inspection. These SWMUs are shown in Figures 3 to 11 and listed in Table 2. Table 2 also provides summary of the potentials for past and ongoing release of hazardous constituents to environmental media for each SWMU. VSI field activities are also summarized in this table.

Inactive Land Disposal and Land Treatment Units (Units 4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.16, 4.67, 4.68)

Releases to the soil and/or groundwater have been documented for all of these units. Wastes and/or contaminated soil still remain in Units 4.1, 4.4, 4.9, 4.10, 4.11, 4.12, 4.13, and 4.14, thus creating on ongoing potential for releases to soil and groundwater. In addition, due to this existing

Table 2

SUMMARY OF VSI FIELD ACTIVITIES AND IDENTIFICATION OF SUMU EXHIBITING POTENTIAL RELEASE OF HAZARDOUS CONSTITUENTS

		Site Inspection		Potential for Past Releases of Hazardous Constituents				Potential for Ongoing Releases of Hazardous Constituents				
Unit	<u>Name</u>	VSI Performed	VSI not Performed	Soil/ CW	Surface Water	<u>Air</u>	Sub- surface Gas	Soil/ GW	Surface Water	<u>Air</u>	Sub- surface Gas	
4.1	Inactive Land Treatment Area "FF"	x		DR	н	М	i.	H	М	L	L	
4.2	Inactive Unit "H"	X		DR	U	H	L	L	N	N	ī	
4.3	Inactive Unit "I"	X		н	บ	υ	М	ช	N	N	บ	
4.4	Inactive Unit "L"	X		DR	υ	U	H	н	N	L,	į.	
4.5	Oil Collection Tanks and Sumps	X		OR	U	U	U	L	N	N	N	
4.6	Inactive Landfill Area "M"	X		DR	U	U	н	L.	N	N	L	
4.7	Inactive Landfill Area "O"	X		DR	υ	υ	H	L	L	N	L	
4.8	Inactive Land Disposal Area "Q"	X		DR	U	Ų	ĸ	L,	L	N	L	
4.9	Inactive Open Burning/Landfill Area	"W" X		DR	RG	H	l,	H	N	N	L	
4.10	Inactive Land Disposal Area "X"	X		DR	RG	М	L	H	M	L	L,	
4.11	Inactive Impoundment"Y"	X		DR	RG	M	L	R	L	N	L,	
4.12	Inactive Landfill Area "Z'"	X		DR	RG	н	L	H	N	N	L	
4.13	Inactive Pond Area "AA"	X		DR	RG	L	N	H	L	L	N	
4.14	Inactive Land Disposal Area "DD"	X		DR	RG	L,	L.	H	M	N	L,	
4.15	Inactive Ballast Water Pond	X		U	U	U	U	U	ប	U	ឋ	
4.16	Inactive Oily Water Sump "N"	X		DR	RG	ប	U	L	N	N	N	
4.17 4.18	Inactive Oily Water Sump "K"	X		DR	RG	M	L 	M	H	L	L	
4.19	Hazardous Waste Drum Storage Area "J			L	L	L	N	L	L	L	N	
4.20	Waste Transfer Station "MM"	X X		н	ե	Ĺ	N	H	L	L	N	
4.21	PCB Storage Area Gross Oil Separator	X		L	L	L	N = 4	L	L.	L	N .	
4.22	Corrugated Plate Interceptor	X		L/U	L.	L	L/U	L/U	L.	L	L/U	
4.23	CPI Trash Screen and Waste Bin	X		L/U	L •	L	L/U	ւ/Մ	L	L	L/0	
4.24	CPI Dumpster Boxes	X		L ,	L.	L	Ň	Ĺ	L	L.	N	
4.25	API Separator Bar Screen and Trash B			L on (r	Ľ.	M	N	Ļ	L	М	N	
4.26	API Separator	χ ,, χ		OR/L	L	M	N .	L	L.	M	N	
4.27	Sand Boxes	x		L/U	Ĺ.	Ļ	น/ช	L/U	L	L	L/U	
4.28	Centrifuge System	x		OR	L	M	Ĺ.	L	L	M	L	
4.29	Flash Mixer/pH Adjustment Unit	X		N . ///	N	L	N	N . m	N	N	N	
4.30	Dissolved Air Flotation Units	x		L/U	L	H	L/U	L/0	L	H	L/U	
4.31	Final pH Adjustment Unit	x		ւ/Մ ւ/Մ	L •	М	L/U	L/U	ŗ	M	L/U	
4.32	Biotreater Equalization Feed Ponds	x		DR	i. L	L H	L/U	L/0	L	L	L/U	
4.33	Emergency Wastewater Holding Ponds	x		DR DR	L		i. L	H	L	H	L ,	
4.34	Activated Sludge Biotreater	x		DR	L L	L		H	L	L	L	
4.35	Two-Stage DAF Clarifiers	X		L L	L L	i.	L N	H	L,	L	L	
4.36	Biotreater Sludge Thickener Unit	x		L L	L L	L,	N N	L	L	L	N	
4.37	Blosludge Storage Tank 1197	x		L	L L	į. M		L •	L	L	N	
4.38	Sand Filter Feed Pond	x		DR	L	M	N	L	L	N	N	
4.39	Sand Filters	x		L L	L L	ե L	Ľ Ň	Ħ	L	L	L	
4.40	Final Holding Pond	x		DR	RG	L L	L L	L H	L	L	N	
		••		UK	r.u	l.	L	m	RG	L	Ĺ	

Table 2 (cont'd)

		Site Inspection		Potential for Past Releases of Hazardous Constituents			Potential for Ongoing Releases of Hazardous Constituents				
Unit	<u>Name</u>	VSI Performed	VSI not Performed	Soil/ GW	Surface Water	<u>Air</u>	Sub- surface Gas	Soll/ GW	Surface Water	<u>Air</u>	Sub- surface Gas
4.41	Sulfide Caustic Flash Pot	X		L.	N	N	N	L	N	N	N
4.42	Caustic Knock-out Pot	X		L	N	N	N	L	N	N	N '
4.43	Caustic Sump	Х		ւ/Ս	ե	N	N	i./U	L	N	N
4.44	Spent Caustic Storage Tank 952	X		L	L	N	N	L	L	N	N
4.45	Spent Caustic Neutralizer	X		L	ւ	N	N	L	L	N	N
4.46	Tank 1068	X		L	ւ	N	N	N	N	N	N
4.47	Waste Storage Tank 1065	X		ւ	ւ	N	N	L	L	N	N
4.48	Waste Storage Tank 383	X		L	L	N	N	t.	L	N	N
4.49	CO Boilers	Х		L	L	H	Ň	L	L	H	N
4.50	CO Boilers Dust Storage Hopper	X		L.	L	L,	N	L	L	L	N
4.51	CO Boilers Dumpster Box		X	L	L	L	N	N	N	N	N
4.52	CO Boilers Dust Storage Area	X		Ł	L	L	N	L	L	L	N
4.53	Inactive Waste Storage Tank 881T	X		Ĭ.	L	N	i.	N	N	N	N
4.54	Waste Storage Tank 482	X		L	L	N	N	ı.	L	N	N
4.55	Waste Inclnerator	X		L	L	H	N	ī.	Ĺ	H	N
4.56	Two ASD Filter Cake Storage Bins	X		L	L	L	N	Ī.	L	Ĺ	N
4.57	PG&E Sludge Terraces	X		н	н	Ĺ	N	L	L	Ĺ	N
4.58	Spent Acid Storage Tank 1218	X		L	L	N	N	ī	ī.	N	N
4.59	Tank 1064	X		L.	L	N	Ĺ	L	L	N	L
4.60	Tank 1063	X		L	L	N	L	Ĺ	L	N	L
4.61	Upper Lake Slobodnik (Stormwater Pond) x		М	RG	L	L	M	RG	L	L
4.62	Lower Lake Slobodnik (Stormwater Pond			м	RG	L	L.	м	RG	ï.	L
4.63	Stormwater Holding Pond	X		DR	M	L	ī.	H	M	L	Ĺ
4.64	Flare Area Stormwater Holding Pond		X	U	RG	L	L	Ŭ	RG	Ĺ	L,
4.65	Vine Hill Stormwater Holding Pond		X	U	RG	L	L	Ū	RG	Ĺ	L
4.66	Stormwater Ponds (Formerly LTA "FF")	Х		н	М	L	L	H	н	L	L
4.67	Inactive Unit "YY"		X	DR	U	U	Ü	i.	Ü	Ū	บิ
4.68	Inactive Unit "ZZ"		X	DR	U	U	Ū	L	Ü	U	Ü

DR = Documented Release

OR = Observed Release

RG = Regulated Discharge

H = High Potential

M - Moderate Potential

L - Low Potential

N - No Potential

U = Undetermined

contamination, there is a moderate potential for the generation of subsurface gas from Units 4.4, 4.6, 4.7, and 4.8. Past releases to surface water and air from Units 4.3, 4.4, 4.5, 4.6, 4.7, and 4.8 could not be evaluated due to lack of information on the units' construction, operation, waste management practices, and release controls. Based on the inactive status of these units there is no or a very low potential for ongoing releases to surface water and air.

Inactive Oily Water Sump "K" (Unit 4.17)

Releases to the soil from this inactive sump have occurred as documented from the site monitoring and the VSI. Wastes still remain on the site and in addition, the unit collects stormwater runoff from the Crude Hill area. Although the unit contains a process sewer drain in its center, there is a high potential for ongoing releases to surface water. A moderate potential for ongoing releases to soil and groundwater also exists from this unit.

Wastewater Holding/Treatment Ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, 4.63, and 4.66)

Releases of metals to groundwater have occurred in an area downgradient of these holding/treatment ponds. The constituents found in the groundwater are also found in the wastewaters and sediment in these ponds. However, since these ponds are all located in the same area and handle similar waste materials, the specific source of these contaminants has not been identified at this time.

Hazardous Waste Storage Area (Unit 4.18)

At the time of the VSI, it was noted that this unit was subject to stormwater run-on from an eroded drainage channel on a steep embankment east of the unit. Sediment had been accumulating behind the curb, allowing a pathway for run-on. This created a high potential for soil and groundwater releases due to overflow. Since the VSI, the facility has removed the sediment and has extended the height of the curb with wooden boards to reduce the potential for storm run-on into the unit.

Waste Transfer Station (Unit 4.19)

The north half of this unit is unpaved and partially bermed and contains the hazardous waste storage bin. There is a high potential for releases to soil and groundwater from this area if spillage or leakage from the waste bin occurs as this unit is unpaved. The release potentials to surface water, air, and subsurface gas generation from this unit are low.

PG&E Sludge Terraces (Unit 4.57)

There was a high potential for past releases from this unit based on its topography and waste management practices. Past soil and groundwater releases from this unit were moderate as the unit was unlined. Although some wastes were present in the unit at the time of the VSI, the wastes appeared to be in a stable, unreactive form. As a result, the ongoing release potentials to soil, groundwater, and air are considered low.

Oil Collection Tanks and Sumps (Unit 4.5) and Inactive Ballast Water Pond (Unit 4.15)

There is little available information concerning the past use, operation, and waste management practices of these two units. As a result, the past release potentials from these unit could not be evaluated.

Units 4.20 to 4.31, 4.35 to 4.37, 4.39, 4.41 to 4.56, 4.58 to 4.62, and 4.64 to 4.65

These units have a low or no potential for releases to soil, groundwater, surface water, air, and subsurface gas generation based on their construction, operation, waste management practices, or release controls.

ENFORCEMENT CONFIDENTIAL

6.0 SUGGESTIONS FOR FURTHER ACTION

A RCRA facility assessment was performed at the Shell Oil Company Martinez Manufacturing Complex in Martinez, California. During the course of this assessment, 68 solid waste management units (SWMUs) were identified and evaluated for their environmental release potential of hazardous wastes or constituents. The environmental release potentials for each of these SWMUs were summarized in Table 2 in Section 5. Based on these release potentials suggestions for further actions are presented in Table 3 for each SWMU and summarized below.

Inactive Land Disposal and Land Treatment Units (Units 4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.16, 4.17, 4.67, 4.68)

Environmental monitoring and assessments of these units are being conducted for these sites under RWQCB guidelines to satisfy the State Water Code (Calderon requirements) and California Administrative Code, Title 23, Subchaper 15 requirements. The assessment includes contaminant source identification and verification, and recommended mitigation measures, including closure of the units. No further actions outside the scope of these monitoring and assessment activities are suggested for these units at this time. Further investigation under corrective action should be predicated on the outcome of these studies.

Wastewater Holding/Treatment Ponds (Unit 4.32, 4.33, 4.34, 4.38, 4.40, 4.63)

Continued groundwater monitoring downgradient of these units is suggested and an attempt should be made to identify specific sources of the contamination. Although groundwater releases from these ponds have occurred, the concentrations of the contaminants found in the groundwater are low. Should significant increases in these contaminants occur in the groundwater, additional containment of the ponds may be warranted.

Waste Transfer Station (Unit 4.19)

Containment of the north half of this unit is inadequate to control releases to soil and groundwater due to spillage from the hazardous waste storage bin.

Table 3

SUMMARY OF SWMUs FOR WHICH
FOLLOW-ON ACTIONS ARE SUGGESTED

	SWMU	Recommended Action						
Unit	Name	Action	No Action	Obtain Additional Information				
								
4.1	Inactive Land Treatment Area "FF"	X						
4.2	Inactive Unit "H"	X						
4.3	Inactive Unit "I"	X						
4.4	Inactive Unit "L"	X						
4.5	Oil Collection Tanks and Sumps			X				
4.6	Inactive Landfill Area "M"	X						
4.7	Inactive Landfill Area "O"	X						
4.8	Inactive Land Disposal Area "Q"	X						
4.9	Inactive Open Burning/Landfill Area "W"	X						
4,10	Inactive Land Disposal Area "X"	X						
.4.11	Inactive Impoundment"Y"	X						
4.12	Inactive Landfill Area "Z'"	X						
4.13	Inactive Pond Area "AA"	X						
4.14	Inactive Land Disposal Area "DD"	X						
4.15	Inactive Ballast Water Pond			X				
4.16	Inactive Oily Water Sump "N"	X						
4.17	Inactive Oily Water Sump "K"	X						
4.18	Hazardous Waste Drum Storage Area "J"		X					
4.19	Waste Transfer Station "MM"	X						
4.20	PCB Storage Area		X					
4.21	Gross Oil Separator		X	•				
4.22	Corrugated Plate Interceptor		X					
4.23	CPI Irash Screen and Waste Bin		X					
4.24	CPI Dumpster Boxes		X					
4.25	API Separator Bar Screen and Trash Bin		X					
4.26	API Separator		X					
4.27	Sand Boxes		X					
4.28	Centrifuge System		X					
4.29	Flash Mixer/pH Adjustment Unit		X					
4.30	Dissolved Air Flotation Units		X					
4.31	Final pH Adjustment Unit		X					
4.32	Biotreater Equalization Feed Ponds	X						
4.33	Emergency Wastewater Holding Ponds	X						
4.34	Activated Sludge Biotreater	X						
4.35	Two-Stage DAF Clarifiers		X					
4.36	Biotreater Sludge Thickener Unit		X					
4.37	Biosludge Storage Tank 1197		X					
4.38	Sand Filter Feed Pond	X						
4.39	Sand Filters		X					
4.40	Final Holding Pond	X						
4.41	Sulfide Caustic Flash Pot		X					
4.42	Caustic Knock-out Pot		X					
4.43	Caustic Sump		X					
4.44	Spent Caustic Storage Tank 952		X					
4.45	Spent Caustic Neutralizer	•	X					

Table 3 (con't)

	SWMU	Recommended Action						
Unit	Name	Action	No Action	Obtain Additional Information				
4.46	Tank 1068		x					
4.47	Waste Storage Tank 1065		X					
4.48	Waste Storage Tank 383		X					
4.49	CO Boilers		X					
4.50	CO Boilers Dust Storage Hopper		X					
4.51	CO Boilers Dumpster Box		X					
4.52	CO Boilers Dust Storage Area		X					
4.53	Inactive Waste Storage Tank 881T		X					
4.54	Waste Storage Tank 482		X					
4.55	Waste Incinerator		X					
4.56	Two ASD Filter Cake Storage Bins		X					
4.57	PG&E Sludge Terraces	X						
4.58	Spent Acid Storage Tank 1218		X					
4.59	Tank 1064		X					
4.60	Tank 1063		X					
4.61	Upper Lake Slobodnik (Stormwater Pond)		X					
4.62	Lower Lake Slobodnik (Stormwater Pond)		X					
4.63	Stormwater Holding Pond	Х						
4.64	Flare Area Stormwater Holding Pond		X					
4.65	Vine Hill Stormwater Holding Pond		X					
4.66	Stormwater Ponds (Formerly LTA "FF")	X						
4.67	Inactive Unit "YY"	X						
4.68	Inactive Unit "ZZ"	X						

Adequate containment of this area to reduce its release potential such as pavement and curbing, is suggested.

PG&E Sludge Terraces (Unit 4.57)

The wastes remaining in this unit appear to be in a stable, unreactive form, thus creating a low potential for releases to soil, groundwater, surface water, and air. The physical and chemical characteristics of this residue should be verified to confirm that hazardous constituents are not being released into the environment. Based on these results, further action under corrective action authorities may be required.

Oil Collection Tanks and Sumps (Unit 4.5) and Inactive Ballast Water Pond (Unit 4.15)

Additional information regarding the past use, operation, and waste management practices of these units should be obtained in order to evaluate past and ongoing release potentials to environmental media. Further action under corrective action authorities should then be reevaluated.

Units 4.18, 4.20 to 4.31, 4.35 to 4.37, 4.39, 4.41 to 4.56, 4.58 to 4.62, 4.64, and 4.65

These units have a low or no potential for releases to environmental media due to their construction, operation, waste management practices, or release controls. As a result, no further action is suggested for these units at this time under corrective action authorities.

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Appendix A

PHOTOGRAPHS

PHOTO LOG

VISUAL SITE INSPECTION SHELL OIL CO, MARTINEZ, CALIFORNIA NOVEMBER 11, 12, 13, 1987

- Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87.
 Aerial view looking south Monitoring well in foreground at arrow; land disposal area in background at left.
- Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87.
 View from center looking southeast.
- Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87.
 View from center looking north.
- 4. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. View from center looking west.
- 5. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. View from road east of unit looking west.
- 6. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. View from road south of unit looking north.
- 7. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. View from road south of unit looking northwest.
- 8. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. View from road west of unit looking east.
- 9. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87.

 Monitoring well on west side of unit in foreground at arrow. Unit in background showing elevational differences.
- 10. Inactive Land Disposal Area "DD" (Unit 4.14), 11/12/87. Drainage area to the southwest of unit.
- 11. Inactive Landfill Area "Z'" (Unit 4.12), 11/12/87.
 View from east edge looking west. Area is currently occupied by Tanks 1256 and 1257.
- 12. Inactive Landfill Area "Z'" (Unit 4.12), 11/12/87. View from east edge looking northwest.
- Inactive Landfill Area "Z'" (Unit 4.12), 11/12/87.
 View from southwest end looking northeast.
- 14. Inactive Landfill Area "Y" (Unit 4.11), 11/12/87.

 View from northeast corner looking southwest. Area is currently used for scrap material storage.
- 15. Inactive Landfill Area "Y" (Unit 4.11), 11/12/87. View from northeast corner looking south.

16. Inactive Landfill Area "Y" (Unit 4.11), 11/12/87. View from southeast corner looking northwest.

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- 17. Inactive Landfill Area "Y" (Unit 4.11), 11/12/87.

 Southeast corner of unit showing monitoring well in foreground.
- 18. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87.

 View from southeast corner looking northwest across unit. Note drainage channel bisecting the site (at arrow).
- 19. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87. View from south end of unit looking northeast.
- 20. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87.

 Seepage areas throughout the unit material appears to be an oily tar.
- 21. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87.

 Drainage channel crossing the unit view is from south end looking north.
- 22. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87. Bank of drainage channel showing soil discolorations.
- 23. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87. Southeast corner of unit showing monitoring well (MW 63) (at arrow).
- 24. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87.

 East edge of unit (left of the fence) showing soil discolorations along fence line. An intermittent drainage channel parallels the east side of the unit and is shown to the right of the fence.
- 25. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87. Peyton Creek bordering the northeast side of the unit.
- 26. Inactive Land Disposal Area "X" (Unit 4.10), 11/12/87. Peyton Creek bordering the northeast side of the unit.
- 27. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Southeast cell view from south end looking northeast.
- 28. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Southeast cell view from south end looking north.
- 29. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Middle east cell view from south end looking north.
- 30. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87.
 Middle east cell view from south end looking northwest.
- 31. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87.
 Middle east cell view from south end looking northeast.
- 32. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87.

 Northeast cell view from south end looking northeast. Note outfall structure in background.

- 33. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Outfall structure at north end of northeast cell.
- 34. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Overflow structure at north end of northeast cell.
- 35. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87. Overflow structure at north end of northwest cell.
- 36. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87.

 Northwest cell view from north end looking southwest.
- 37. Inactive Landfill Area "AA" (Unit 4.13), 11/12/87.
 Northwest cell view from north end looking south.
- 38. Inactive Oily Water Sump "N" (Unit 4.16), 11/12/87.

 View from approximate center of unit looking north. Unit boundary extends up to warehouse building.
- 39. Inactive Oily Water Sump "N" (Unit 4.16), 11/12/87. Location of soil boring within unit (at arrow).
- 40. Inactive Landfill Area "O" (Unit 4.7), 11/12/87.

 Aerial view from road north of unit looking south. Area is currently used as a sandblasting area.
- 41. Inactive Landfill Area "O" (Unit 4.7), 11/12/87. Aerial view from road north of unit looking southeast.
- 42. Inactive Landfill Area "O" (Unit 4.7), 11/12/87. Aerial view from road north of unit looking southeast.
- 43. Inactive Landfill Area "O" (Unit 4.7), 11/12/87.

 Aerial view from road north of unit looking east. Soil piles are from road construction activities.
- 44. Inactive Landfill Area "O" (Unit 4.7), 11/12/87.

 Aerial view from road north of unit showing waste piles generated from sandblasting activities and from shutdown of flexicoker operation.

 Monitoring well is shown in background at arrow.
- 45. Inactive Land Disposal Area "Q" (Unit 4.8), 11/12/87. View from west edge of unit looking north.
- 46. Inactive Land Disposal Area "Q" (Unit 4.8), 11/12/87. View from west edge of unit looking northeast.
- 47. Inactive Land Disposal Area "Q" (Unit 4.8), 11/12/87.

 View from west edge of unit looking east. Lake Slobodnik (Unit 4.61) is shown in background.
- 48. Inactive Land Disposal Area "Q" (Unit 4.8), 11/12/87. View from west edge of unit looking southeast.

- 49. Stormwater Retention Pond Upper Lake Slobodnik (Unit 4.61), 11/12/87. View from west end of unit looking northeast.
- 50. Stormwater Retention Pond Upper Lake Slobodnik (Unit 4.61), 11/12/87. View from west end of unit looking east.
- 51. Stormwater Retention Pond Upper Lake Slobodnik (Unit 4.61), 11/12/87. View from west end of unit looking southeast.
- 52. Stormwater Retention Pond Lower Lake Slobodnik (Unit 4.62), 11/12/87. View from road east of unit looking southwest.
- 53. Stormwater Retention Pond Lower Lake Slobodnik (Unit 4.62), 11/12/87. View from road east of unit looking west.
- 54. Stormwater Retention Pond Lower Lake Slobodnik (Unit 4.62), 11/12/87. View from effluent end of unit showing discharge channel to the north.
- 55. Stormwater Retention Pond Lower Lake Slobodnik (Unit 4.62), 11/12/87. View from effluent end of unit showing discharge channel to the north.
- 56. Inactive Landfill Area "H" (Unit 4.2), 11/12/87.

 View from northwest corner of unit looking south. Area is currently occupied by Tank 1161.
- 57. Inactive Landfill Area "H" (Unit 4.2), 11/12/87. View from north edge of unit looking east.
- 58. Inactive Landfill Area "H" (Unit 4.2), 11/12/87.

 View from northwest corner of unit looking southeast.
- 59. Inactive Landfill Area "H" (Unit 4.2), 11/12/87. View from northwest corner of unit looking east.
- 60. Inactive Landfill Area "I" (Unit 4.3), 11/12/87.

 View from central part of unit looking west. Area is now paved and occupied by a parking lot and truck weighing area.
- 61. Inactive Landfill Area "I" (Unit 4.3), 11/12/87. View from central part of unit looking southwest.
- 62. Inactive Landfill Area "I" (Unit 4.3), 11/12/87. View from north end of unit looking south.
- 63. Inactive Landfill Area "I" (Unit 4.3), 11/12/87. View from north end of unit looking southeast.
- 64. Inactive Landfill Area "I" (Unit 4.3), 11/12/87. View from north end of unit looking southeast.
- 65. Inactive Landfill Area "I" (Unit 4.3), 11/12/87. View from north end of unit looking east.
- 66. Inactive Oily Water Sump "K" (Unit 4.17), 11/12/87. Aerial view from road west of unit looking east.

- 67. Inactive Oily Water Sump "K" (Unit 4.17), 11/12/87. Aerial view from road west of unit looking east.
- 68. Inactive Oily Water Sump "K" (Unit 4.17), 11/12/87.

 Aerial view from hillside west of unit looking northeast.
- 69. Inactive Oily Water Sump "K" (Unit 4.17), 11/12/87. View from west edge of unit looking east.
- 70. Inactive Oily Water Sump "K" (Unit 4.17), 11/12/87.

 View from west edge of unit looking east. Note drain in background at arrow.
- 71. Inactive Landfill Area "L" (Unit 4.4), 11/12/87.

 Aerial view from road west of unit looking north. Site is currently used as a fire training area.
- 72. Inactive Landfill Area "L" (Unit 4.4), 11/12/87. Aerial view from road west of unit looking northeast.
- 73. Inactive Landfill Area "L" (Unit 4.4), 11/12/87. Aerial view from road west of unit looking east.
- 74. Inactive Landfill Area "L" (Unit 4.4), 11/12/87.

 View showing monitoring well in southwest corner of unit (at arrow).
- 75. Inactive Landfill Area "M" (Unit 4.6), 11/12/87.

 Aerial view from road south of unit looking northwest. Site is currently occupied by process areas.
- 76. Inactive Landfill Area "M" (Unit 4.6), 11/12/87.

 Aerial view from road south of unit looking northeast.
- 77. Inactive Landfill Area "M" (Unit 4.6), 11/12/87. Aerial view from road south of unit looking northeast.
- 78. Corrugated Plate Interceptor (CPI) (Unit 4.22), 1/12/87. View from influent end (south end) looking north across unit.
- 79. Corrugated Plate Interceptor (CPI) (Unit 4.22), 1/12/87. View from influent end looking across unit.
- 80. Corrugated Plate Interceptor (CPI) (Unit 4.22), 1/12/87. View showing influent end of unit (south end).
- 81. Corrugated Plate Interceptor (CPI) (Unit 4.22), 1/12/87. View from southwest corner looking northeast across unit.
- 82. CPI Trash Screen Waste Bin (Unit 4.23), 11/12/87.

 View showing back side of trash screen unit. This unit is located on the southwest corner of the CPI.
- 83. CPI Trash Screen Waste Bin (Unit 4.23), 11/12/87.

 View showing waste bin in foreground and front side of trash screen unit.

- 84. Corrugated Plate Interceptor (CPI) (Unit 4.22), 11/12/87.

 Area south of CPI showing oily pavement and drain. CPI waste bin is shown on left.
- 85. CPI Dumpster Boxes (Unit 4.24), 11/12/87.

 One of three dumpsters located to the west of the CPI. View is of west face of south dumpster.
- 86. CPI Dumpster Boxes (Unit 4.24), 11/12/87.

 Inside of south dumpster showing discharge into the unit.
- 87. CPI Dumpster Boxes (Unit 4.24), 11/12/87. South face of south dumpster showing discharge hose.
- 88. CPI Dumpster Boxes (Unit 4.24), 11/12/87. View showing discharge from south dumpster.
- 89. CPI Dumpster Boxes (Unit 4.24), 11/12/87. View showing west face of middle dumpster.
- 90. CPI Dumpster Boxes (Unit 4.24), 11/12/87. View showing inside of middle dumpster.
- 91. CPI Dumpster Boxes (Unit 4.24), 11/12/87. View showing effluent end of north dumpster.
- 92. Inactive Open Burning and Landfill Area "W" (Unit 4.9), 11/12/87. Site is currently leased by Genstar and is occupied by a parking lot and partially by a building. View from south edge looking west across unit.
- 93. Inactive Open Burning and Landfill Area "W" (Unit 4.9), 11/12/87. View from south edge looking northwest across unit.
- 94. Inactive Open Burning and Landfill Area "W" (Unit 4.9), 11/12/87. View from south edge looking north across unit.
- 95. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87. View showing north end of unit.
- 96. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87. View showing central part of unit.
- 97. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87. View showing south end of unit.
- 98. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87.
 View showing south end of unit. Note drums on pallets and concrete curb surrounding area.
- 99. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87. View showing drainage pipe on northwest corner of unit.
- 100. Hazardous Waste Drum Storage Area (Unit 4.18), 11/12/87. Hillside east of unit showing runoff channel.

- 101. PCB Storage Area (Unit 4.20), 11/12/87. View facing east.
- 102. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87.

 Aerial view from waste transfer station (Unit 4.19) east of unit.
- 103. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. View showing west oil tank.
- 104. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. West tank showing overflow structure.
- 105. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. West tank showing overflow structure.
- 106. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. Concrete sump located south of west tank.
- 107. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. View showing inside of concrete sump.
- 108. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87.

 View showing east tank (background), unlined sump covered with wooden boards (right foreground), overflow structure (center), and stained soil (left foreground).
- 109. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. Hillside south of unit showing possible influent pipes.
- 110. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. Area north of unit showing stained soil.
- 111. Inactive Oil Tank and Sump Area (Unit 4.5), 11/12/87. Area north of unit showing stained soil.
- 112. Waste Transfer Station (Unit 4.19), 11/13/87.

 Southeast corner of unit showing asbestos waste storage bin. Note drain in right foreground.
- 113. Waste Transfer Station (Unit 4.19), 11/13/87. View showing south central portion of unit.
- 114. Waste Transfer Station (Unit 4.19), 11/13/87. Southwest corner of unit showing empty drum storage area.
- 115. Waste Transfer Station (Unit 4.19), 11/13/87.
 West end of unit showing oil recovery drum. Note drain in left foreground.
- 116. Waste Transfer Station (Unit 4.19), 11/13/87.

 View showing the northwest corner of unit. Note blue structure is top of hazardous waste storage bin, which is located in an adjacent, lower elevation area.

- 117. Waste Transfer Station (Unit 4.19), 11/13/87.
 View showing north face of hazardous waste storage bin.
- 118. Waste Transfer Station (Unit 4.19), 11/13/87.

 Northeast corner of unit showing nonhazardous waste storage and loading area.
- 119. Waste Transfer Station (Unit 4.19), 11/13/87. View showing nonhazardous waste loading operation.
- 120. Waste Storage Tank 383 (Unit 4.48), 11/13/87. View facing south.
- 121. Waste Storage Tank 383 (Unit 4.48), 11/13/87. View facing southwest.
- 122. Waste Storage Tank 383 (Unit 4.48), 11/13/87. View facing southeast.
- 123. CO Boilers (Unit 4.49), 11/13/87. View showing east boiler unit.
- 124. CO Boilers (Unit 4.49), 11/13/87. View showing east boiler unit.
- 125. CO Boilers (Unit 4.49), 11/13/87. View showing middle boiler unit.
- 126. CO Boilers (Unit 4.49), 11/13/87. View showing west boiler unit.
- 127. Boiler Dust Hopper (Unit 4.50), 11/13/87.
 Unit is located between the west and middle boiler units.
- 128. Boiler Dust Hopper (Unit 4.50), 11/13/87.

 Hopper unit is shown at top of photo. Dust dumpster box (Unit 4.51) was located below the hopper. Dust is currently collected in bags.
- 129. Boiler Dust Hopper (Unit 4.50), 11/13/87. View showing dust bagging operation below hopper.
- 130. Caustic Knock Out Pot, V-511 (Unit 4.42), 11/13/87. View showing north face of vessel.
- 131. Sulfide Caustic Flash Pot, V-510 (Unit 4.41), 11/13/87. Vessel is directly above V-511. Both vessel occupy the same casing.
- 132. Sulfide Caustic Flash Pot, V-510 (Unit 4.41), 11/13/87. View showing inlet connections to vessel.
- 133. Vessels V-510 and V-511 (Units 4.41 and 4.42), 11/13/87. View showing outlet structures for the vessels.
- 134. Caustic Sump (Unit 4.43), 11/13/87. View from west side of unit looking east.

- 135. Caustic Sump (Unit 4.43), 11/13/87. View facing west.
- 136. Caustic Sump (Unit 4.43), 11/13/87. View facing south.
- 137. Spent Caustic Storage Tank 952 (Unit 4.44), 11/13/87. View showing south face of tank.
- 138. Spent Caustic Storage Tank 952 (Unit 4.44), 11/13/87. View showing southwest face of tank.
- 139. Spent Caustic Storage Tank 952 (Unit 4.44), 11/13/87. Sump located in southwest corner of bermed containment.
- 140. Spent Caustic Neutralizer (Unit 4.45), 11/13/87. View facing southwest.
- 141. Spent Caustic Neutralizer (Unit 4.45), 11/13/87.
 View facing south.
- 142. Spent Caustic Neutralizer (Unit 4.45), 11/13/87.

 Lower portion of unit showing inlet and outlet controls.
- 143. Spent Caustic Neutralizer (Unit 4.45), 11/13/87.
 View showing discharge point for unit.
- 144. Boiler Fines Temporary Storage Area (Unit 4.52), 11/13/87.
 View showing bags covered with plastic.
- 145. Boiler Fines Temporary Storage Area (Unit 4.52), 11/13/87. View showing bags used to store the boiler fines.
- 146. Gross Oil Separator (Unit 4.21, 11/13/87. View facing west showing north end of unit.
- 147. Gross Oil Separator (Unit 4.21), 11/13/87.
 View facing west showing middle section of unit.
- 148. Gross Oil Separator (Unit 4.21), 11/13/87. View facing west showing south end of unit.
- 149. Gross Oil Separator (Unit 4.21), 11/13/87. View from south end of unit facing north.
- 150. PG&E Sludge Terraces (Unit 4.57), 11/13/87.

 View of upper terrace facing northwest. Note waste material remaining in unit.
- 151. PG&E Sludge Terraces (Unit 4.57), 11/13/87. View of upper terrace facing west.
- 152. PG&E Sludge Terraces (Unit 4.57), 11/13/87.
 View from upper terrace looking northeast over middle terrace.

- 153. PG&E Sludge Terraces (Unit 4.57), 11/13/87.
 View from lower road east of unit looking southwest.
- 154. Bar Screen Unit (Unit 4.25), 11/13/87.
 Unit is located at influent end of API separator (Unit 4.26). East face of unit showing bin where trash is collected.
- 155. Bar Screen Unit (Unit 4.25), 11/13/87. View showing east face of unit.
- 156. API Separator (Unit 4.26), 11/13/87.

 View from southwest corner at influent end looking northeast across unit.
- 157. API Separator (Unit 4.26), 11/13/87.

 View looking northwest across influent end of separator. Note two sand boxes (Unit 4.27) behind unit, bar screen unit (Unit 4.25) to the left of the sand boxes, and a third sand box behind stairway at left.
- 158. Sand Boxes (Unit 4.27), 11/13/87.

 One of three sand boxes (behind stairway) located southwest of API separator.
- 159. Sand Boxes (Unit 4.27), 11/13/87.

 Two sand boxes located adjacent to the northwest corner of the API separator view facing west. Note oily soil within bermed area.
- 160. Sand Boxes (Unit 4.27), 11/13/87.

 View showing south face of middle sand box. Note oily stains within bermed area.
- 161. Centrifuges (Unit 4.28), 11/13/87. View showing primary centrifuge.
- 162. Centrifuges (Unit 4.28), 11/13/87. View showing secondary centrifuge.
- 163. Flash Mixer/pH Adjustment Unit (Unit 4.29), 11/13/87. View facing south.
- 164. Flash Mixer/pH Adjustment Unit (Unit 4.29), 11/13/87. View looking into unit.
- 165. Dissolved Air Flotation (DAF) Units (Unit 4.30), 11/13/87. View facing west overlooking north DAF unit.
- 166. Dissolved Air Flotation (DAF) Units (Unit 4.30), 11/13/87. View of south DAF unit facing northwest.
- 167. Dissolved Air Flotation (DAF) Units (Unit 4.30), 11/13/87. View showing floating material on surface and effluent weir.
- 168. Final pH Adjustment Unit (Unit 4.31), 11/13/87. View facing north.

- 169. Final pH Adjustment Unit (Unit 4.31), 11/13/87. View facing north.
- 170. Biotreater Equalization Feed Ponds (Unit 4.32), 11/13/87. East pond (Pond 4) view from south end looking north. Note aerators in pond.
- 171. Biotreater Equalization Feed Ponds (Unit 4.32), 11/13/87. West pond (Pond 3) view from south end looking north.
- 172. Emergency Wastewater Holding Ponds (Unit 4.33), 11/13/87.

 East pond (Pond 2) view from south end looking north. Note discoloration of banks.
- 173. Emergency Wastewater Holding Ponds (Unit 4.33), 11/13/87. West pond (Pond 1) view from south end looking north.
- 174. Emergency Wastewater Holding Ponds (Unit 4.33), 11/13/87. Southwest corner of east pond (Pond 2) showing oil film on water surface and discoloration of bank.
- 175. Activated Sludge Biotreater (Unit 4.34), 11/13/87. View from west end looking east. Note aerators and mixers within unit.
- 176. Activated Sludge Biotreater (Unit 4.34), 11/13/87. View from west end looking northeast.
- 177. Activated Sludge Biotreater (Unit 4.34), 11/13/87. View from west end looking north.
- 178. Air Flotation Clarifiers (Unit 4.35), 11/13/87.

 First-stage clarifier (south unit) (concrete tanks) view looking northwest.
- 179. Air Flotation Clarifiers (Unit 4.35), 11/13/87.

 View showing first-stage clarifier (south unit) in foreground, second-stage clarifiers (cone-shaped tanks) in right background, and air saturation tank (white tank) in left background.
- 180. Air Flotation Clarifiers (Unit 4.35), 11/13/87. View showing second-stage clarifier.
- 181. Air Flotation Clarifiers (Unit 4.35), 11/13/87. View showing second-stage clarifier.
- 182. Air Flotation Clarifiers (Unit 4.35), 11/13/87. View showing air saturation tank.
- 183. Air Flotation Clarifiers (Unit 4.35), 11/13/87. View showing air saturation tank.
- 184. Sand Filter Feed Pond (Pond 5A) (Unit 4.38), 11/13/87. View from east end looking south.

- 185. Sand Filter Feed Pond (Pond 5A) (Unit 4.38), 11/13/87. View from east end looking southwest.
- 186. Sand Filter Feed Pond (Pond 5A) (Unit 4.38), 11/13/87. View from east end looking west.
- 187. Sand Filters (Unit 4.39), 11/13/87. Elevation view of unit.
- 188. Sand Filters (Unit 4.39), 11/13/87. Southeast filter unit showing wash water trough.
- 189. Sand Filters (Unit 4.39), 11/13/87. Southwest filter unit showing top of filter media and wash water trough.
- 190. Biotreater Sludge Thickener (Unit 4.36), 11/13/87. Elevation view of unit.
- 191. Biotreater Sludge Thickener (Unit 4.36), 11/13/87. View facing south.
- 192. Biosludge Storage Tank 1197 (Unit 4.37), 11/13/87. View showing southwest face of tank.
- 193. Biosludge Storage Tank 1197 (Unit 4.37), 11/13/87. View showing southwest face of tank.
- 194. Final Holding Pond (Pond 5B) (Unit 4.40), 11/13/87. View from southeast corner looking west.
- 195. Final Holding Pond (Pond 5B) (Unit 4.40), 11/13/87. View from southeast corner looking northwest.
- 196. Final Holding Pond (Pond 5B) (Unit 4.40), 11/13/87.
 View from southeast corner looking northwest at effluent end.
- 197. Tank 1068 (Unit 4.46), 11/13/87.
 View showing south face of tank.
- 198. Tank 1068 (Unit 4.46), 11/13/87.
 Note ponded water within bermed area.
- 199. Inactive Ballast Water Pond (Unit 4.15), 11/13/87. View from southwest corner looking north.
- 200. Inactive Ballast Water Pond (Unit 4.15), 11/13/87. View from southwest corner looking northeast.
- 201. Stormwater Holding Pond (Pond 6) (Unit 4.63), 11/13/87.
 View from southwest corner looking north.
- 202. Stormwater Holding Pond (Pond 6) (Unit 4.63), 11/13/87.
 View from southeast end looking north.

- 203. Stormwater Holding Pond (Pond 6) (Unit 4.63), 11/13/87. View from walkway looking north.
- 204. Stormwater Holding Pond (Pond 6) (Unit 4.63), 11/13/87. South end of pond showing oily sludge on surface.
- 205. Stormwater Holding Pond (Pond 6) (Unit 4.63), 11/13/87. West bank of pond showing discoloration.
- 206. Inactive Land Treatment Area "FF" (Unit 4.1 and 4.66), 11/13/87.

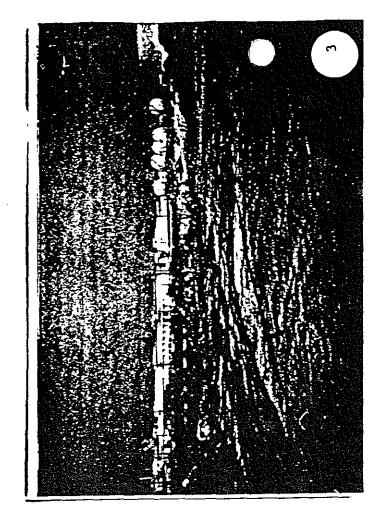
 Area is currently used for stormwater retention. View from west bank of north pond looking northeast.
- 207. Inactive Land Treatment Area "FF" (Unit 4.1 and 4.66), 11/13/87. View from west bank of north pond looking east.
- 208. Inactive Land Treatment Area "FF" (Unit 4.1 and 4.66), 11/13/87. View from west bank of middle pond looking east.
- 209. Inactive Land Treatment Area "FF" (Unit 4.1 and 4.66), 11/13/87. View of west bank of south pond looking east.
- 210. Tanks 1063 (Unit 4.60), 1064 (Unit 4.59), and 1065 (Unit 4.47), 11/13/87. View facing east.
- 211. Tank 1063 (Unit 4.60), 11/13/87. View showing west face of tank.
- 212. Tank 1063 (Unit 4.60), 11/13/87.
 View showing tank drain.
- 213. Tank 1065 (Unit 4.47), 11/13/87.
 View showing tank drain.
- 214. Tanks 1063 (Unit 4.60), 1064 (Unit 4.59), and 1065 (Unit 4.47), 11/13/87. View showing earthen berm along north side of tanks.
- 215. Tank 1218 (Unit 4.58), 11/13/87. View showing west face of tank.
- 216. Tank 1218 (Unit 4.58), 11/13/87. View showing tank drain.
- 217. Tank 881T (Unit 4.53), 11/13/87.
- 218. Tank 881T (Unit 4.53), 11/13/87.
- 219. Tank 881T (Unit 4.53), 11/13/87. View showing tank drain.
- 220. Tank 881T (Unit 4.53), 11/13/87. View showing containment wall for tank.
- 221. Tank 218T, 11/13/87.

- 222. Tank 218T, 11/13/87.
- 223. Tank 218T, 11/13/87. Possible sump for Tank 218T.

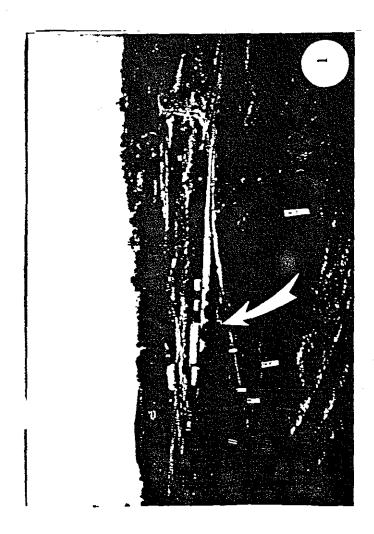
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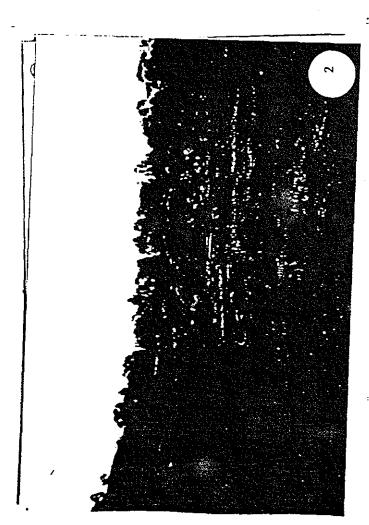
- 224. Waste Storage Tank 482V (Unit 4.54), 11/12/87.
- 225. Waste Storage Tank 482V (Unit 4.54), 11/12/87.
- 226. Waste Incinerator (Unit 4.55), 11/12/87.
- 227. Waste Incinerator (Unit 4.55), 11/12/87.
- 228. Waste Incinerator (Unit 4.55), 11/12/87.
- 229. Waste Incinerator (Unit 4.55), 11/12/87.
- 230. Cooling Tower for Waste Incinerator, 11/12/87.
- 231. ASD Filter Cake Storage Bin (Unit 4.56), 11/12/87.
- 232. ASD Filter Cake Storage Bin (Unit 4.56), 11/12/87.

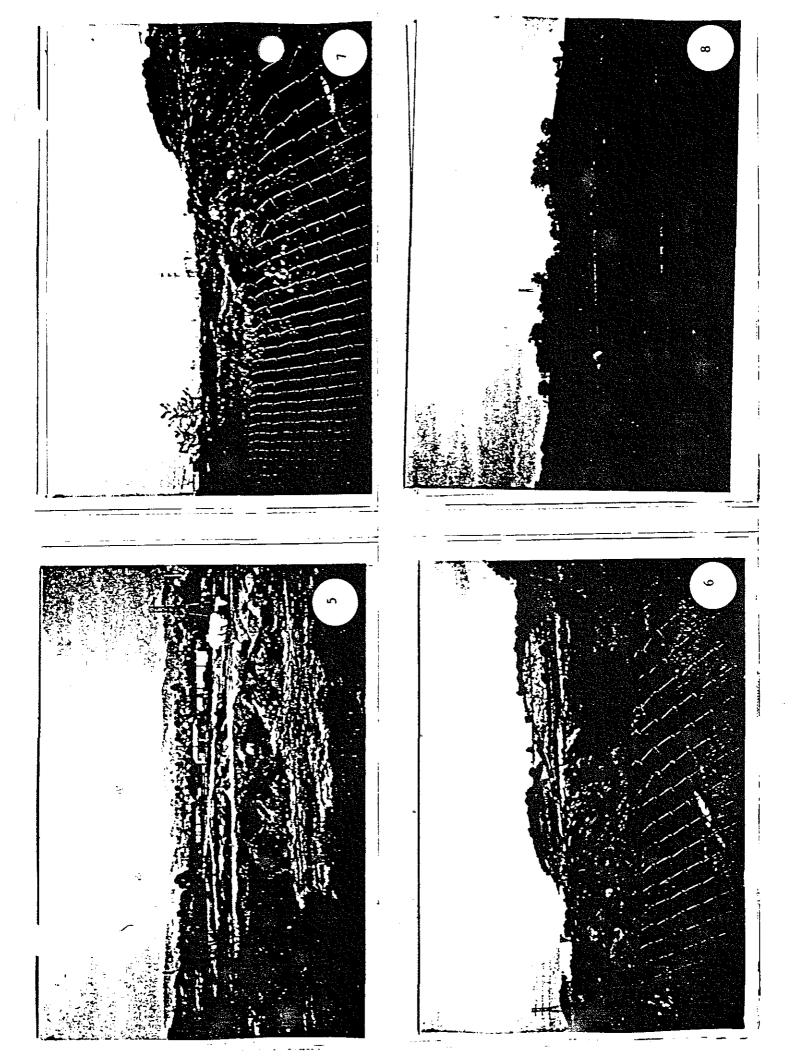
NOTE: The CBI photographs have been sent to the Regional Project Officer under separate cover. Negatives are stored in the locked cabinet at Kearney/Centaur, Redwood City.

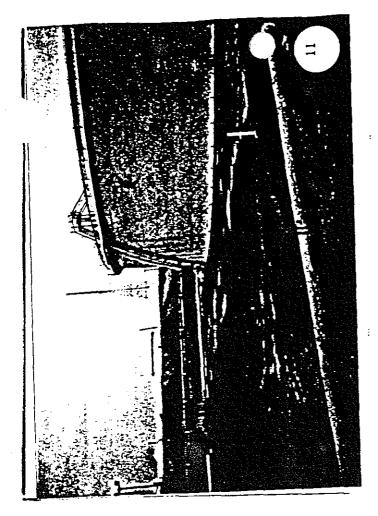


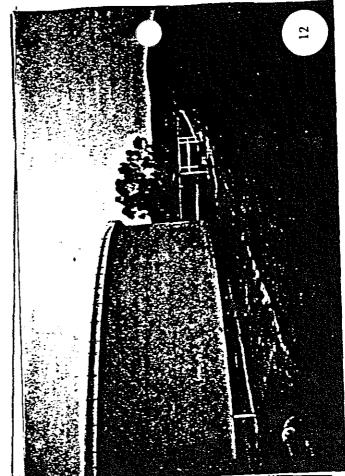


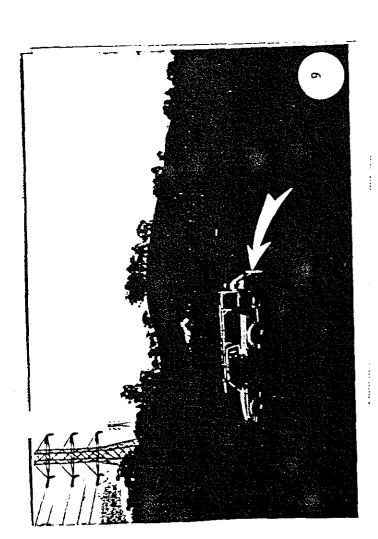


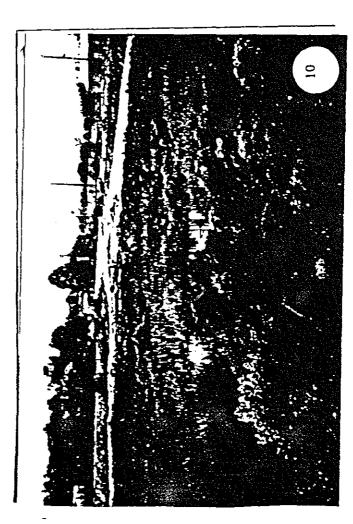


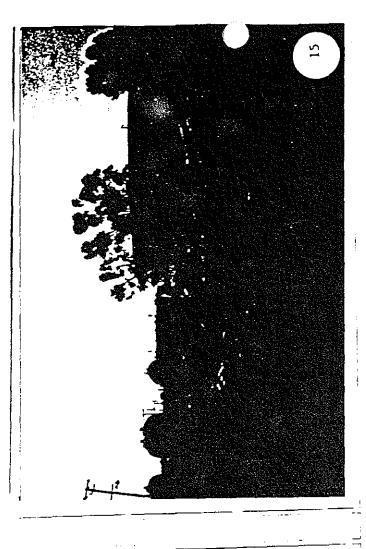




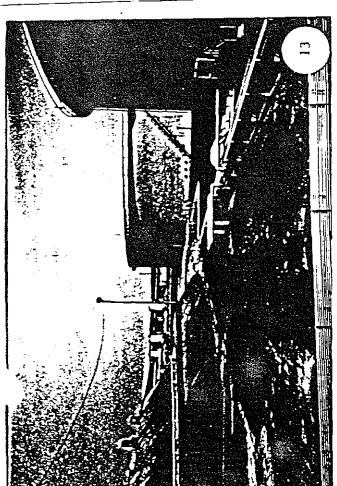


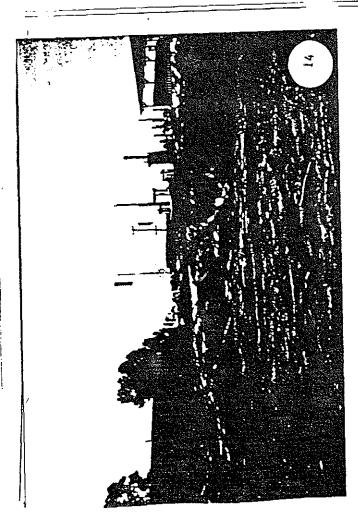


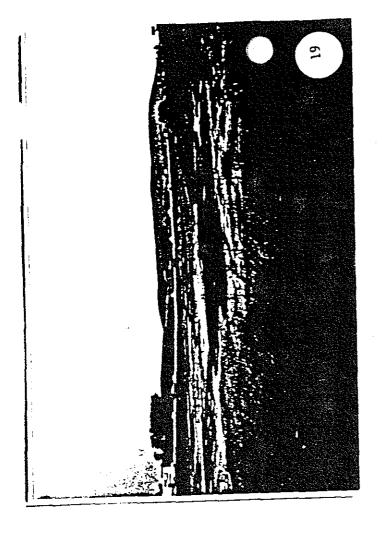


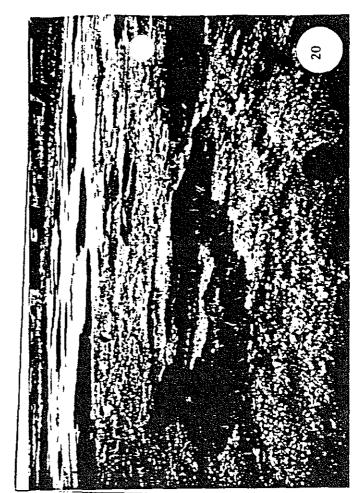


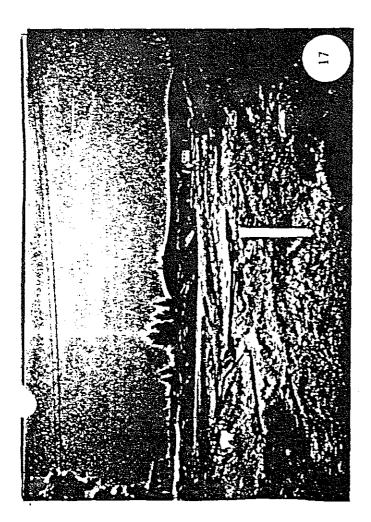






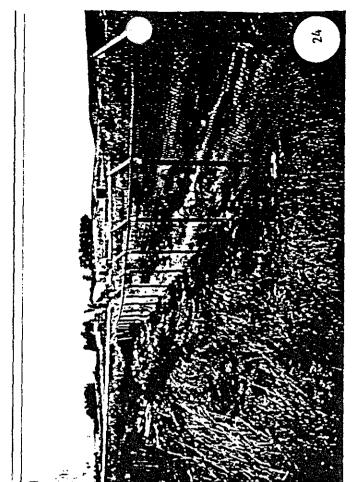


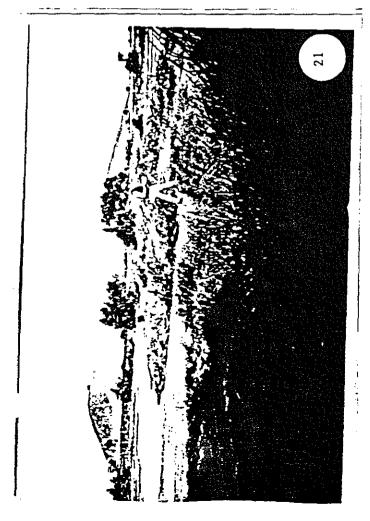


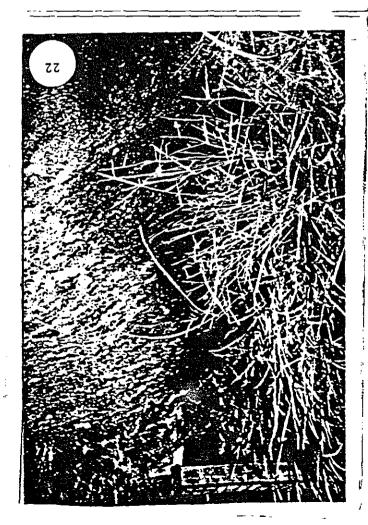






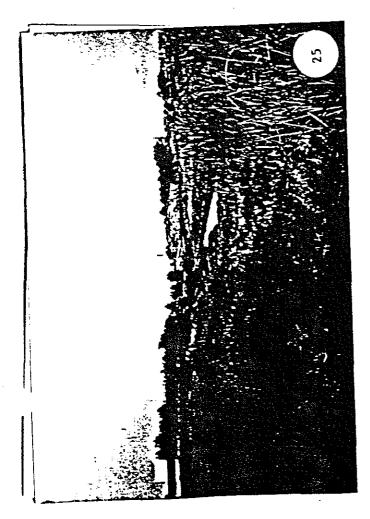


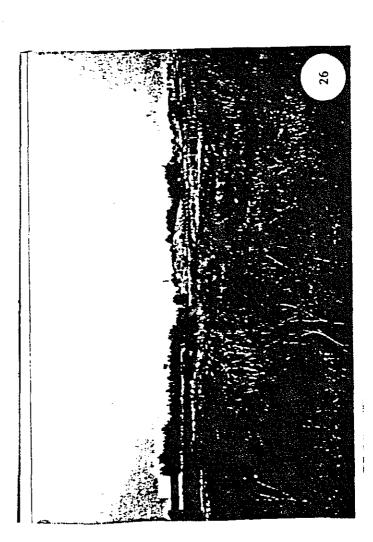








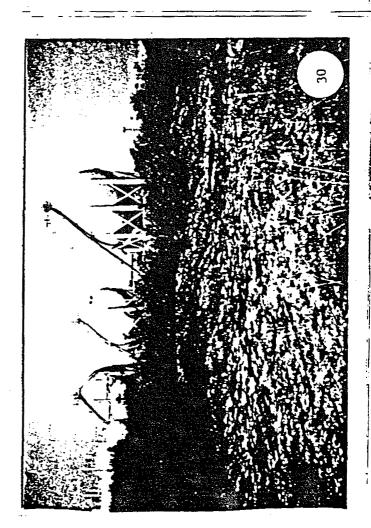






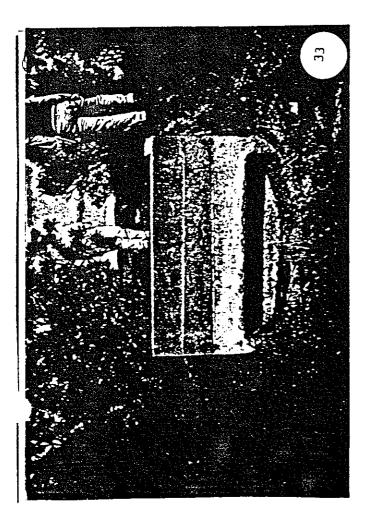




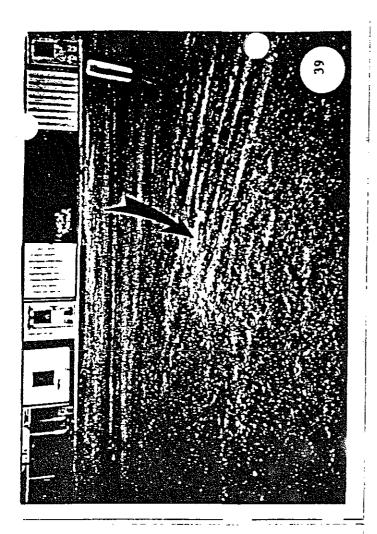


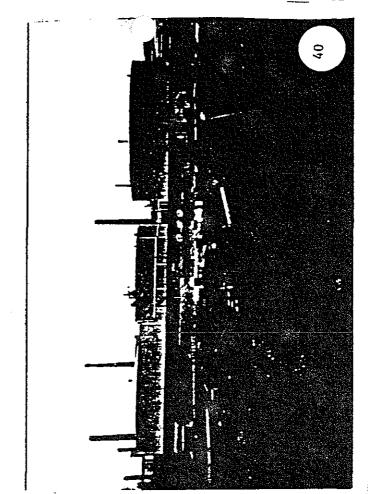


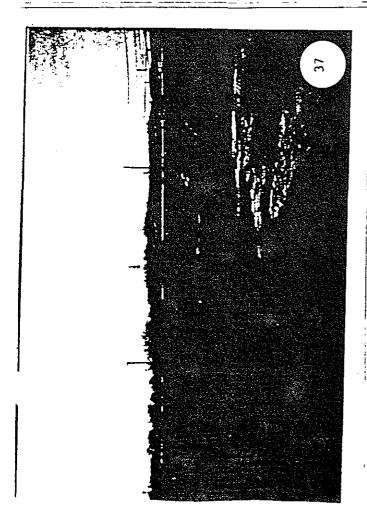


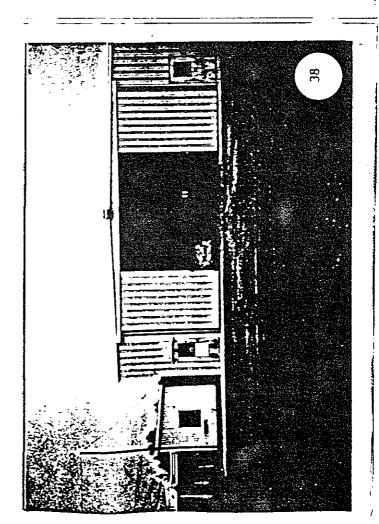


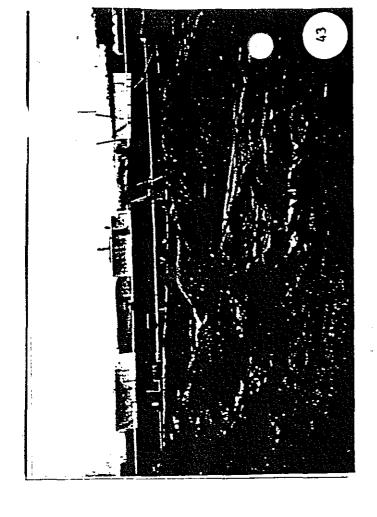




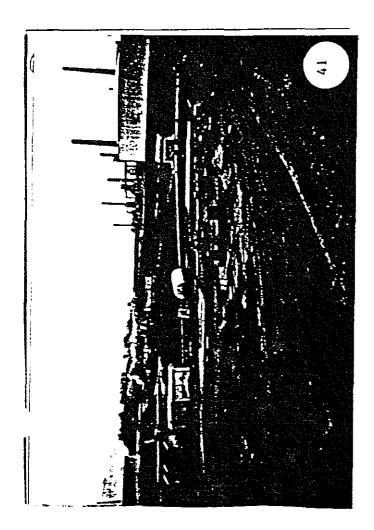


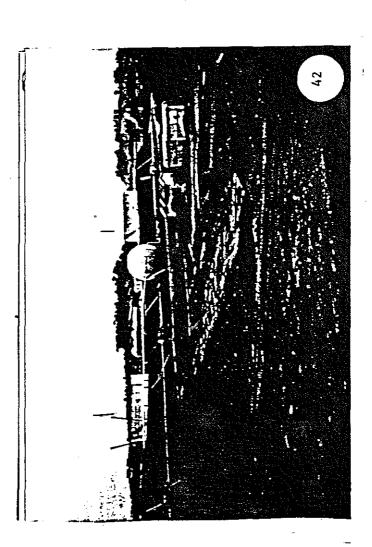


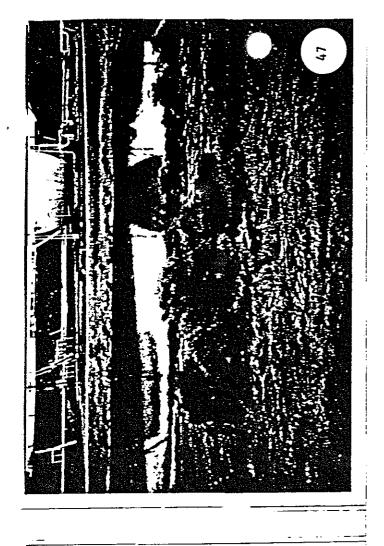


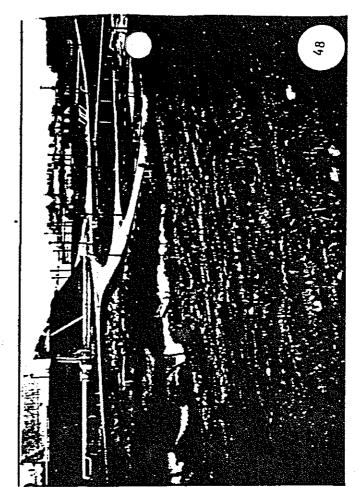


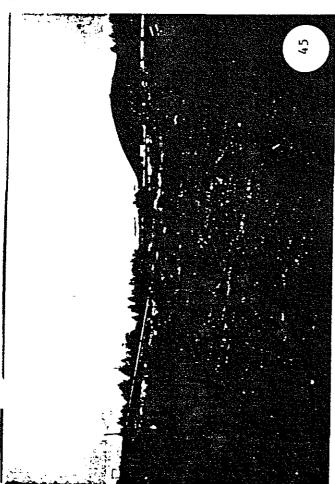




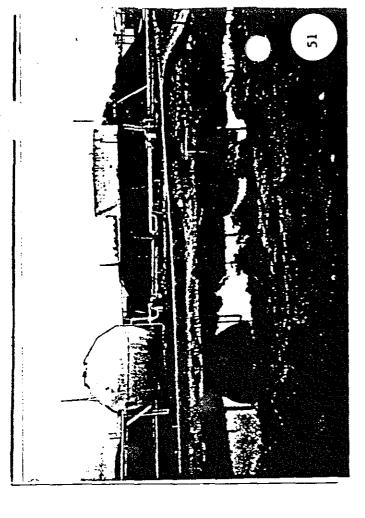




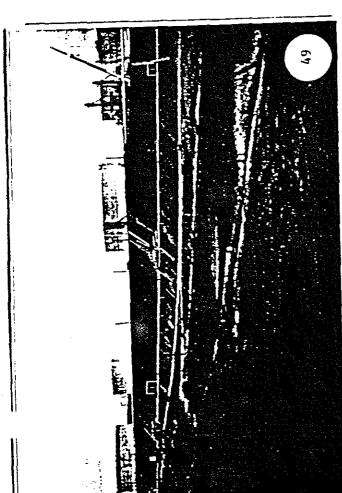


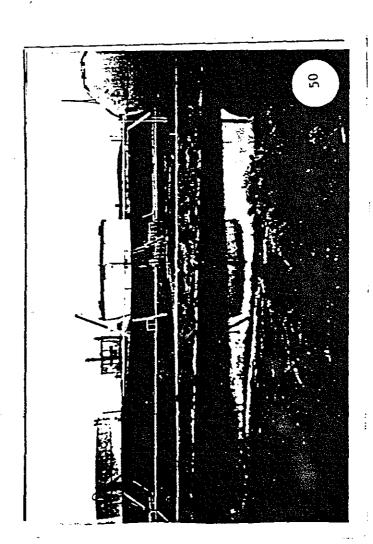


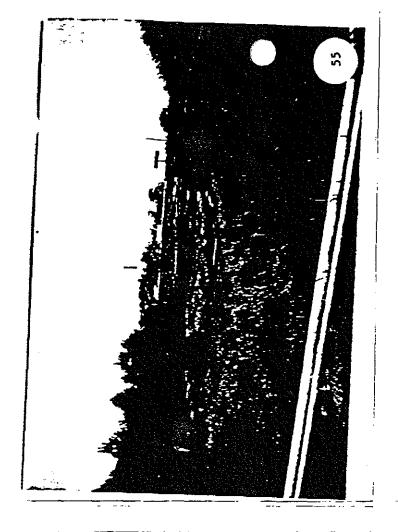


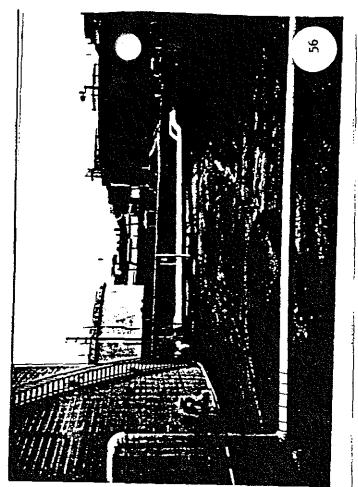






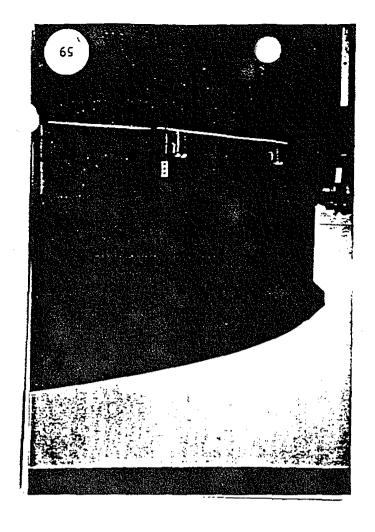


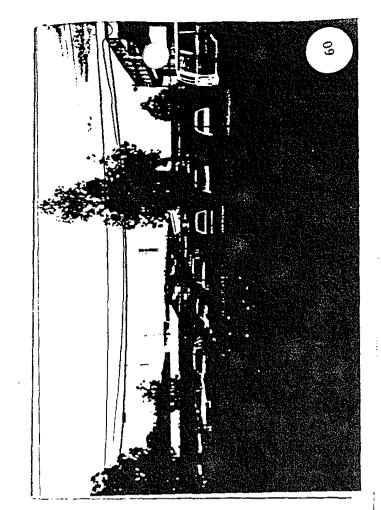


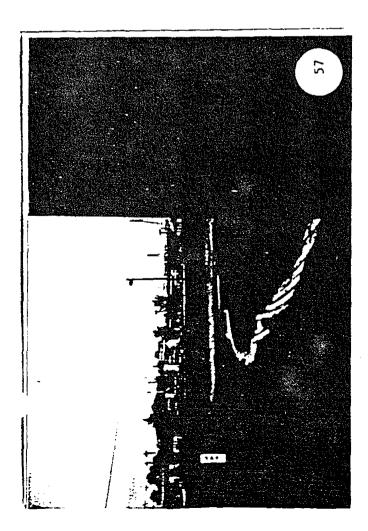


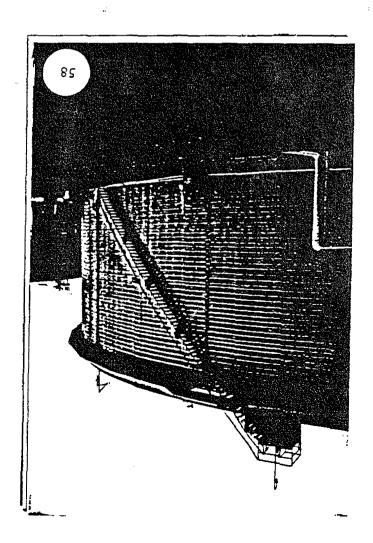


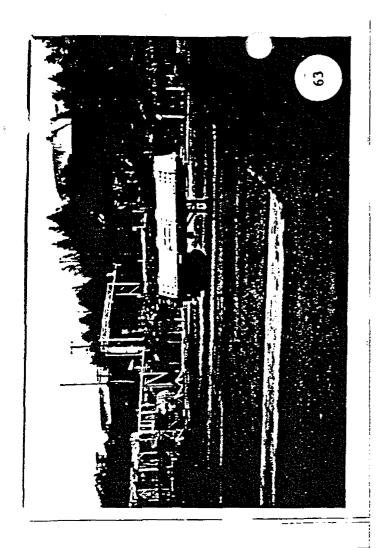


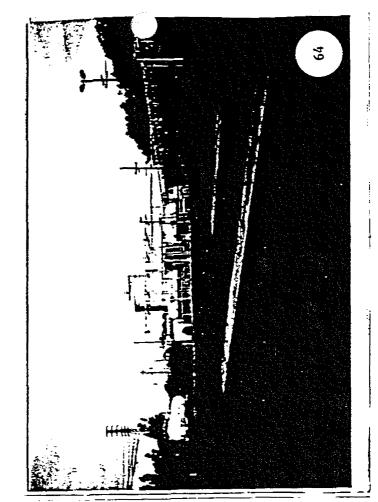


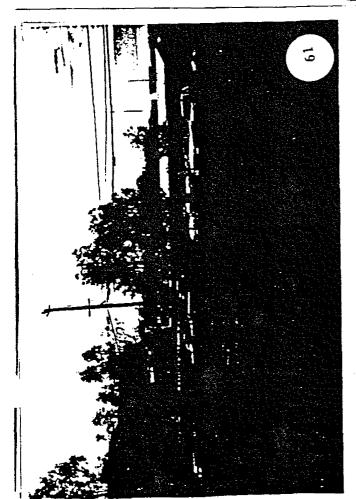


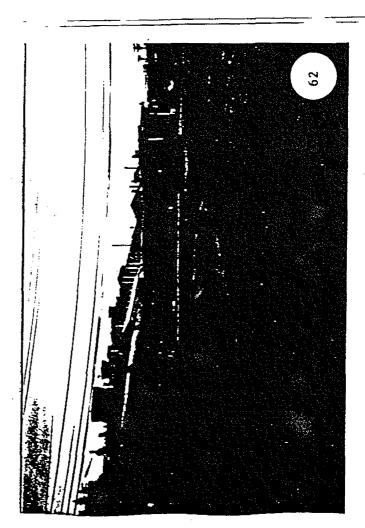


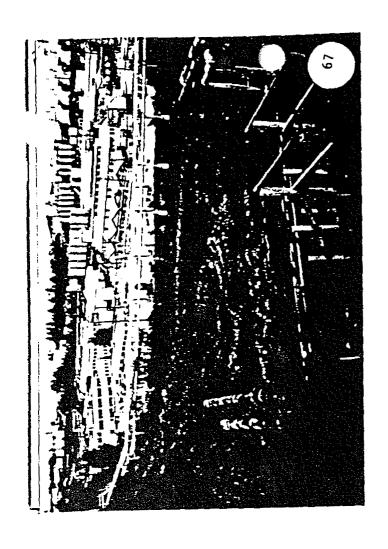


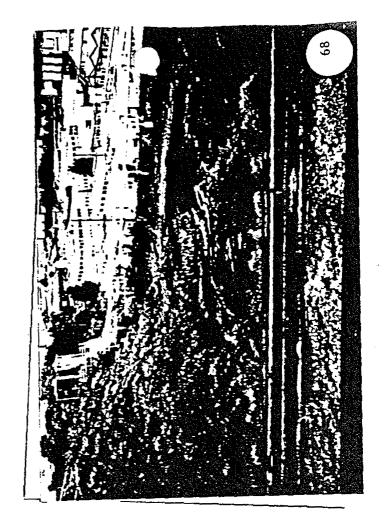


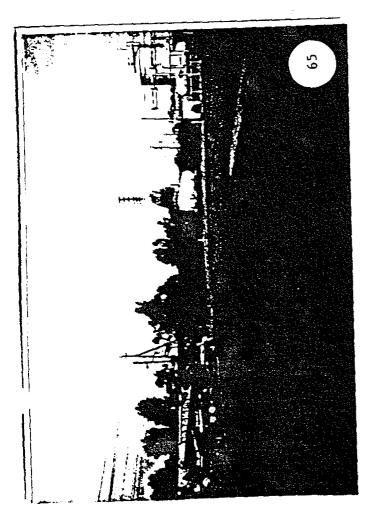


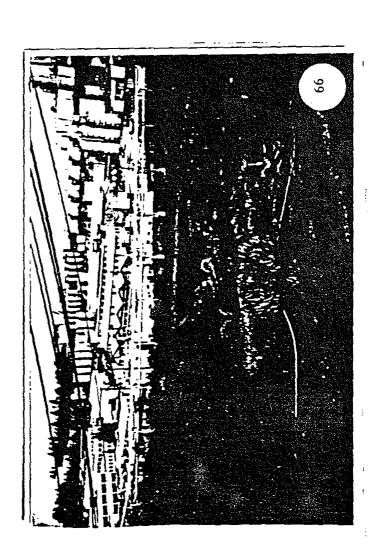


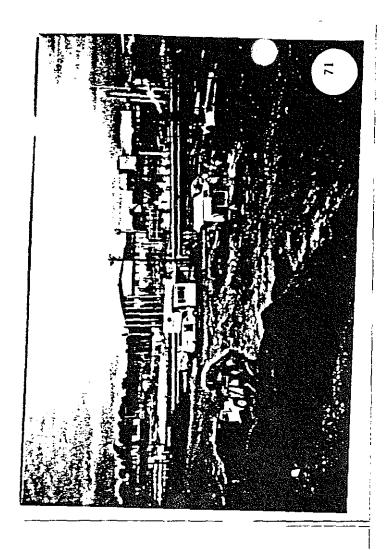


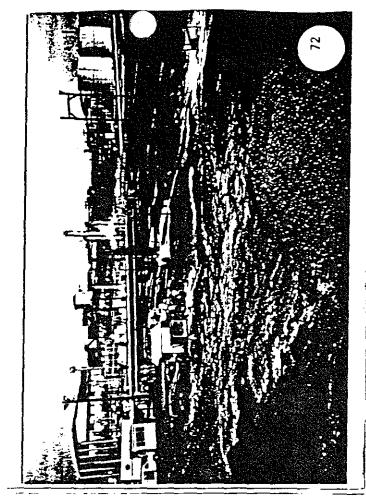


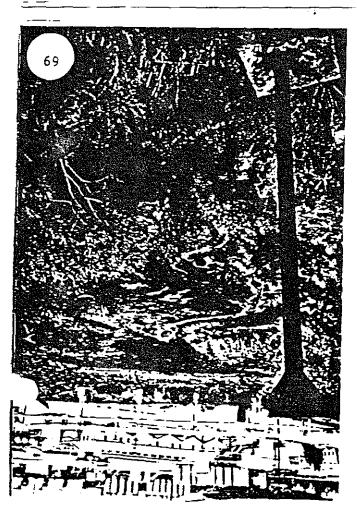




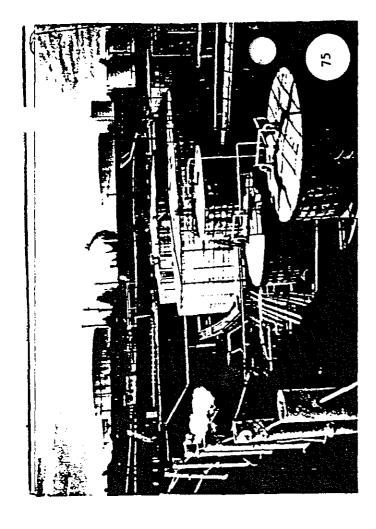


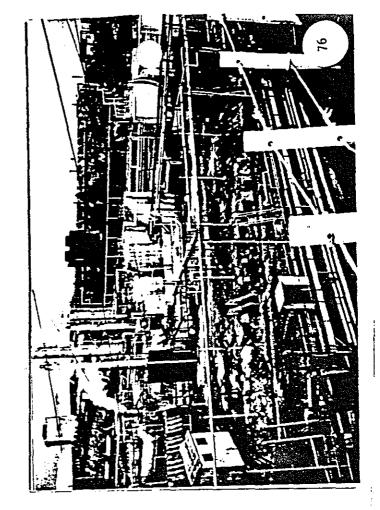


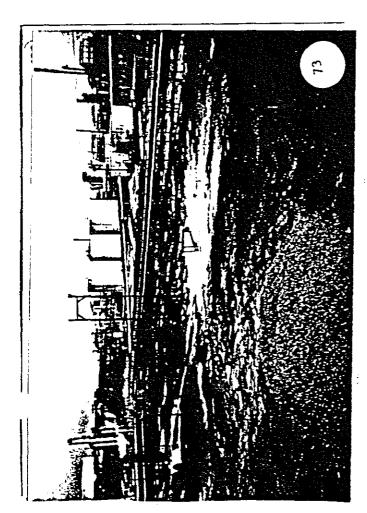




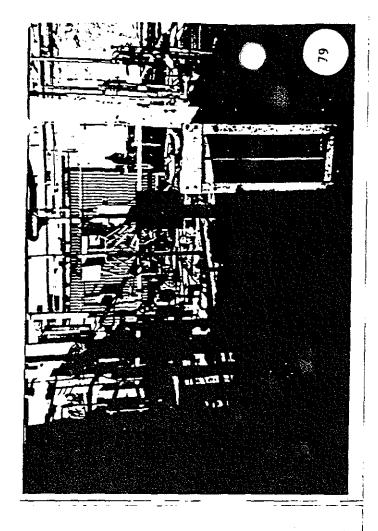


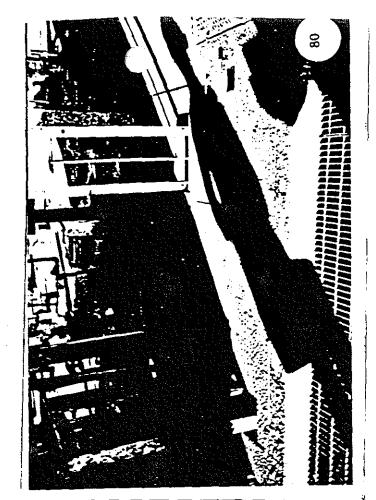


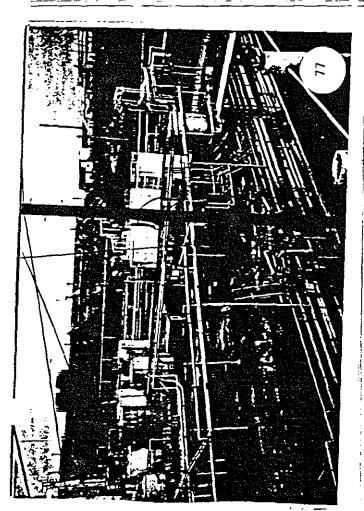


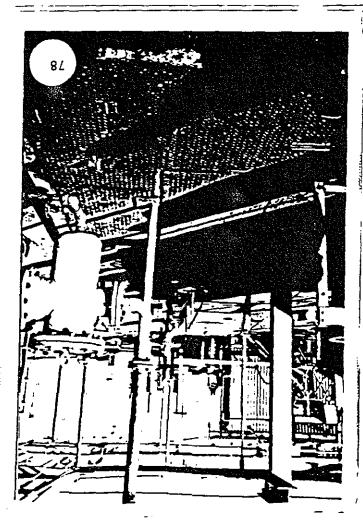


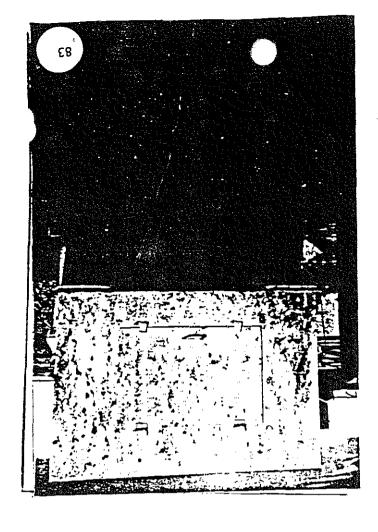


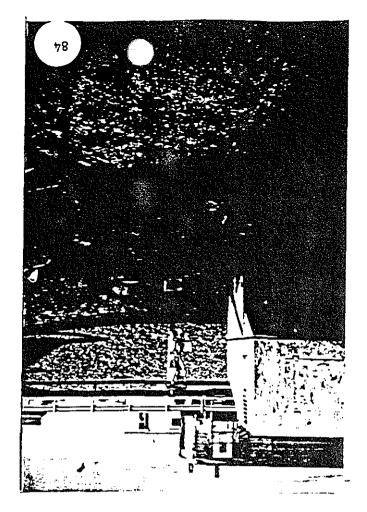


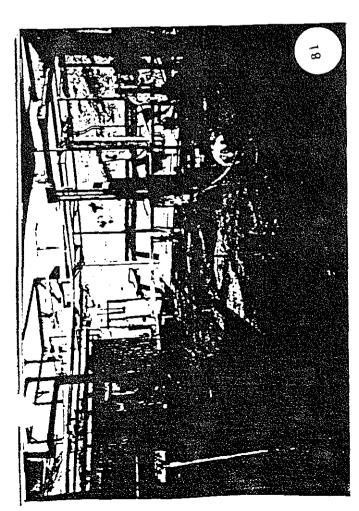


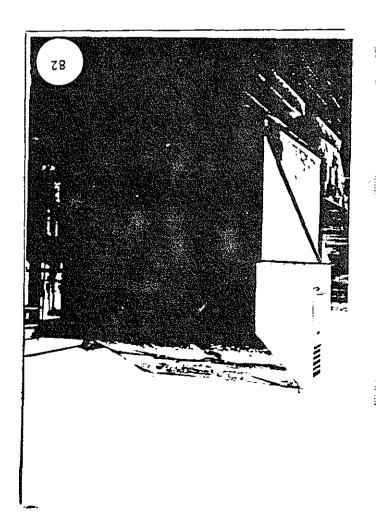




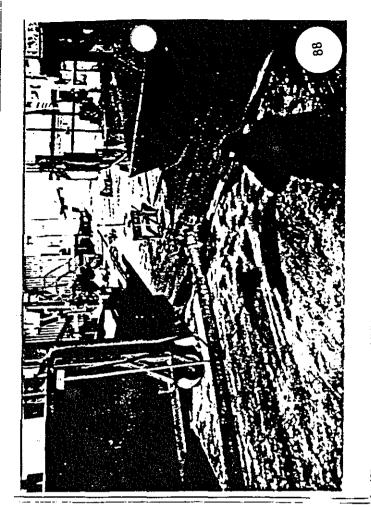


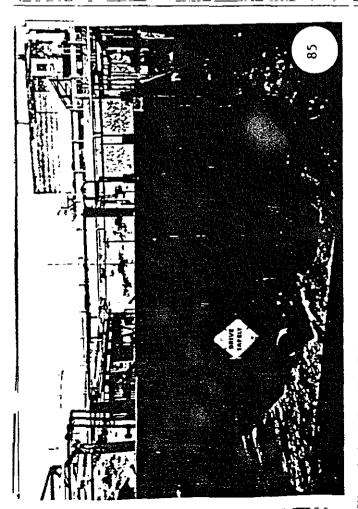


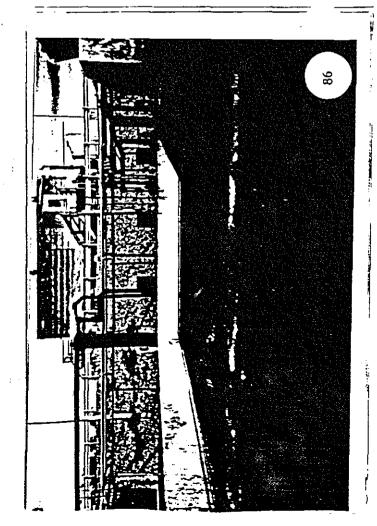


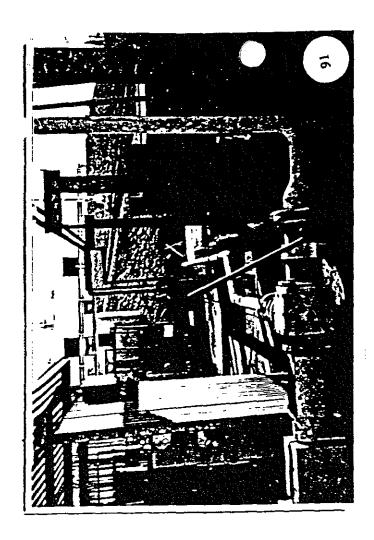




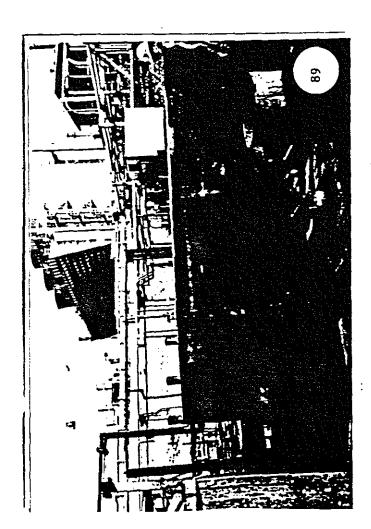


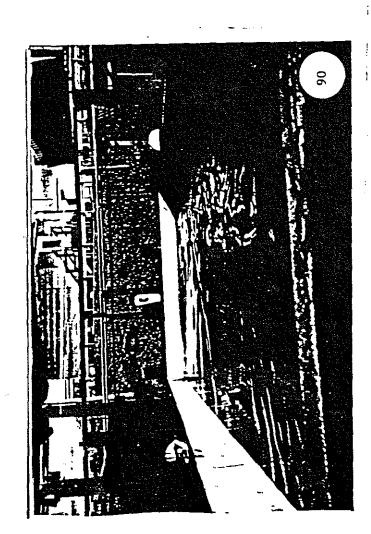


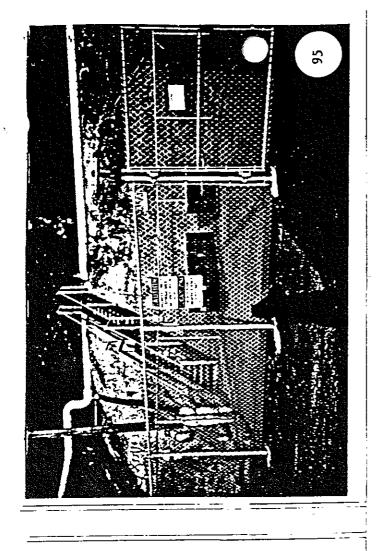


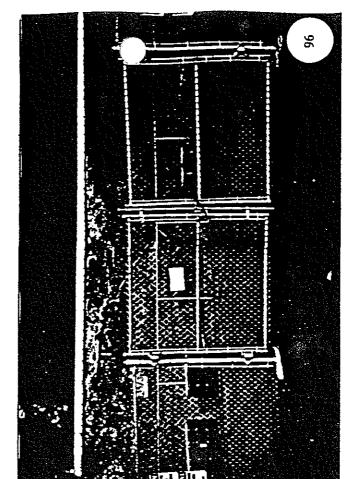


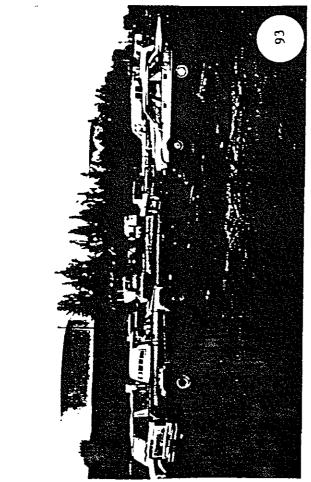


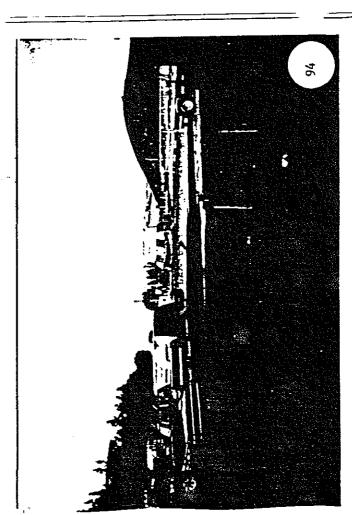


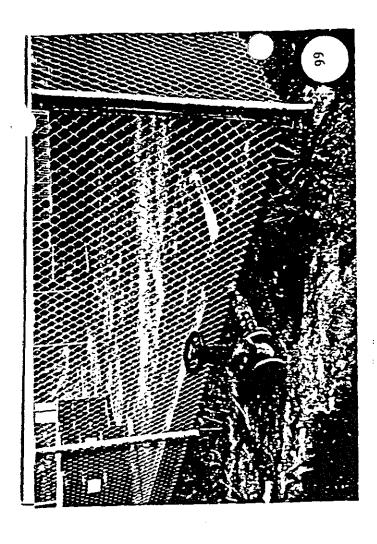


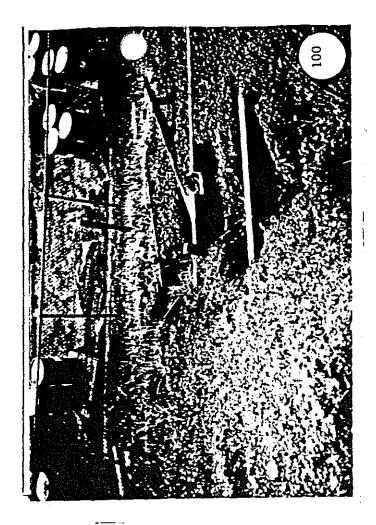


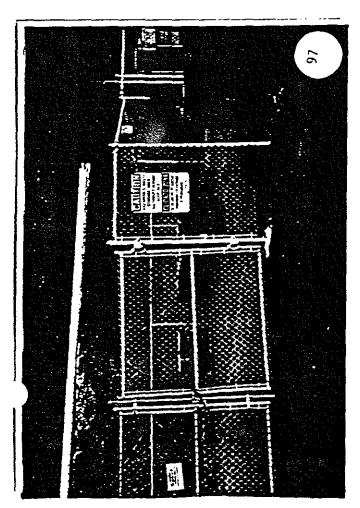


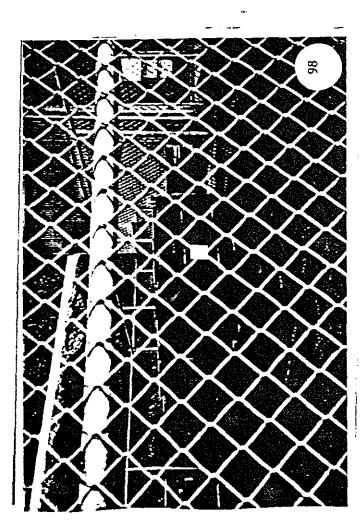




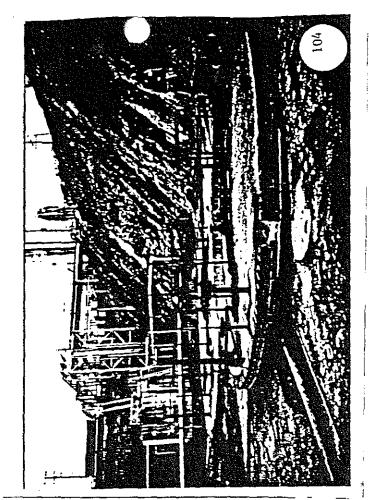


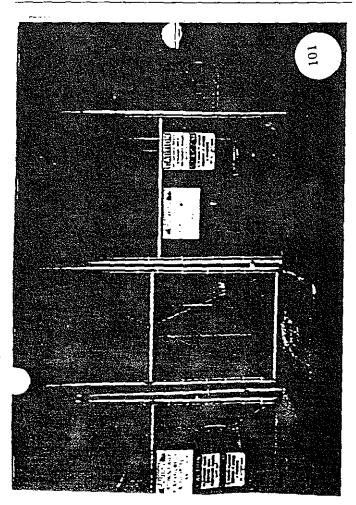


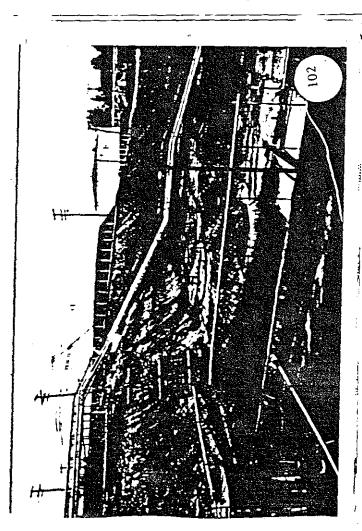


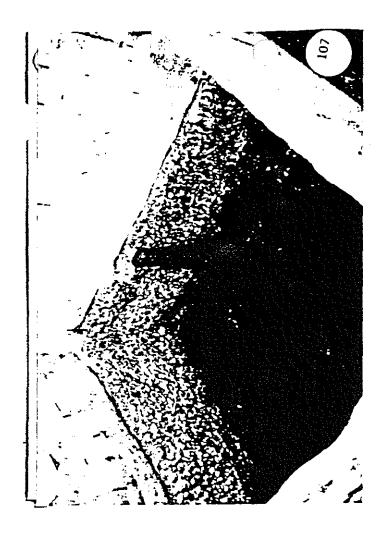


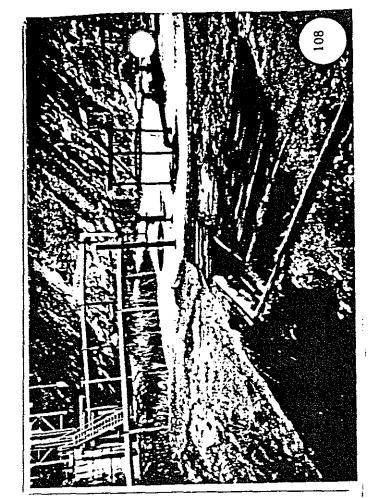






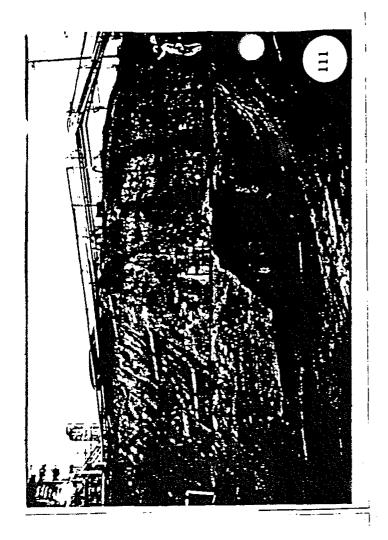


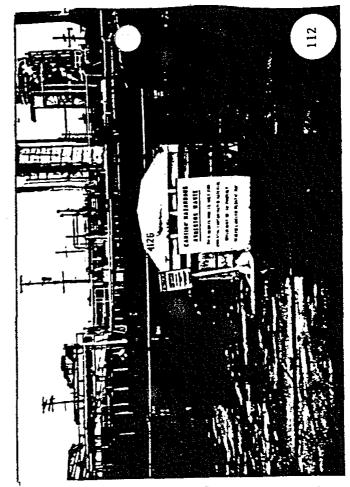






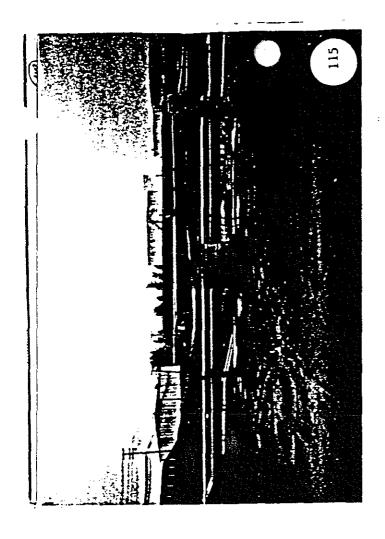




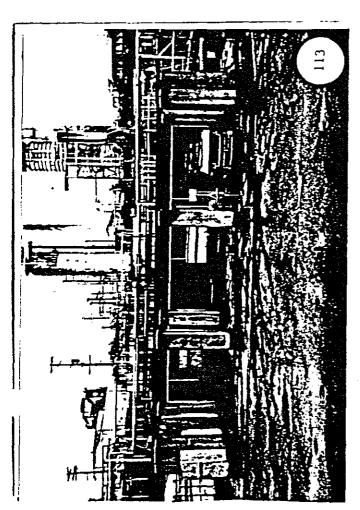


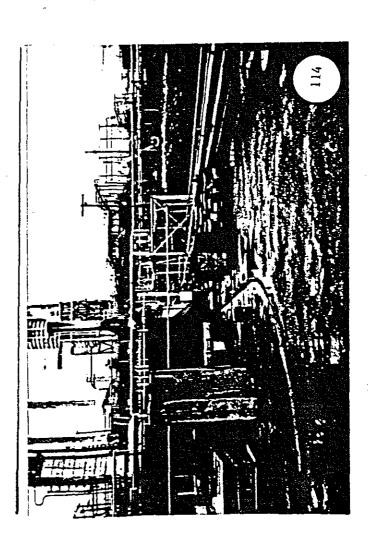


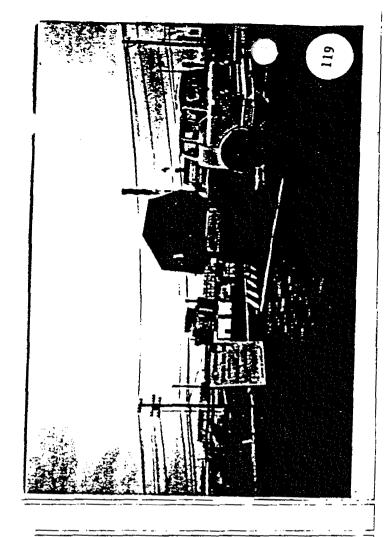


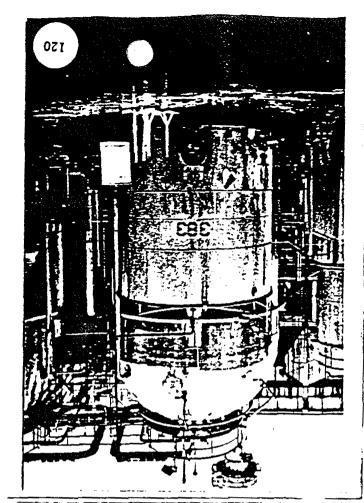


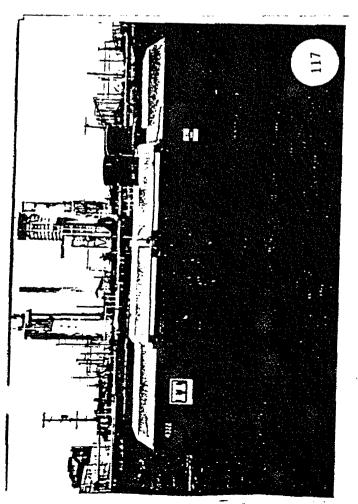


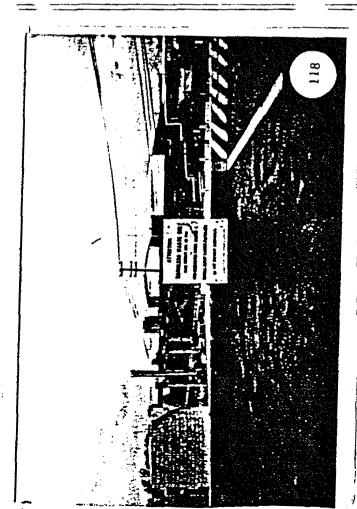


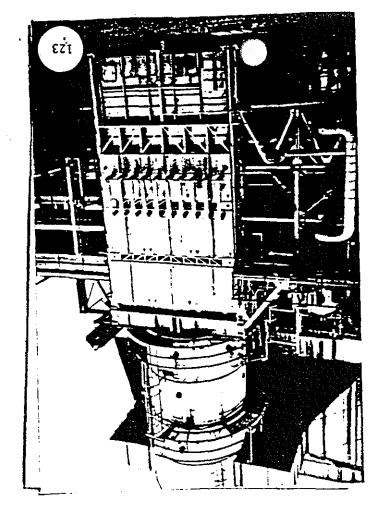


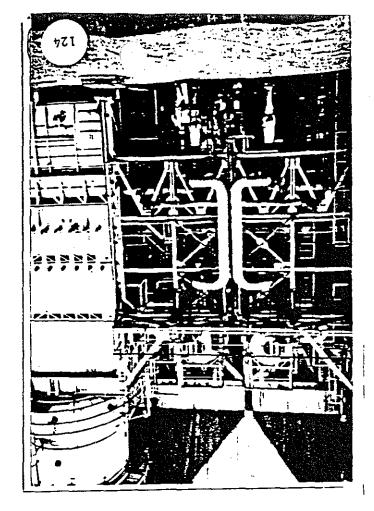


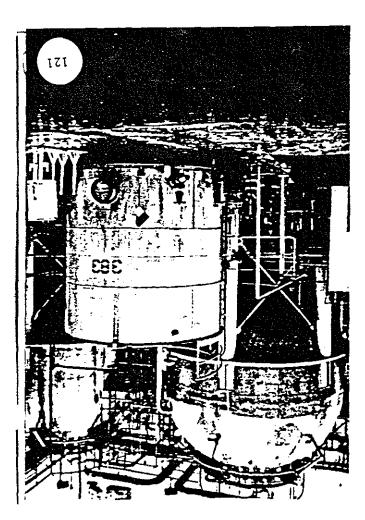


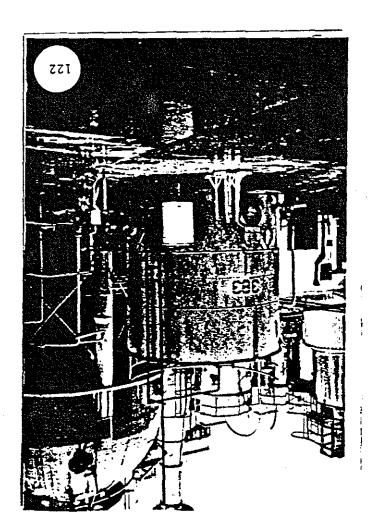


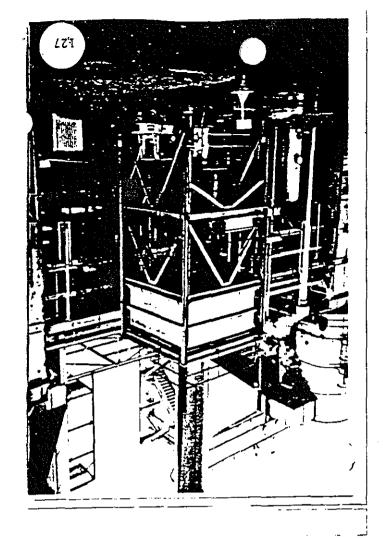


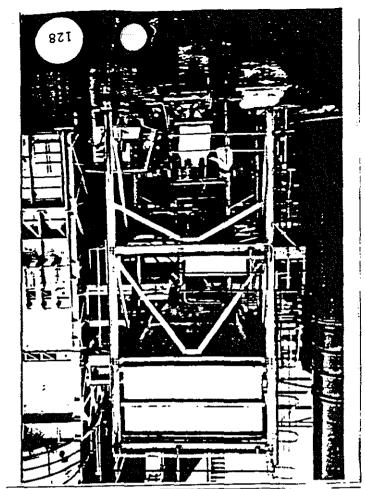


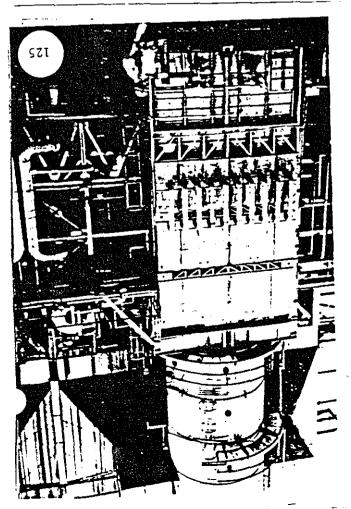


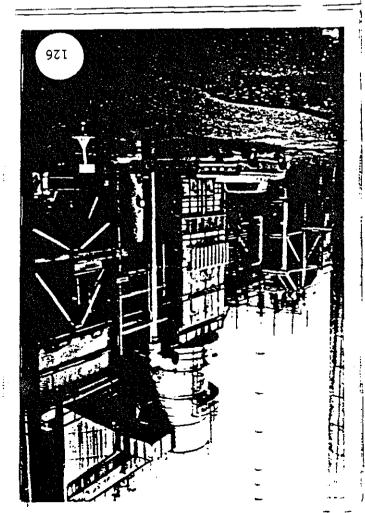


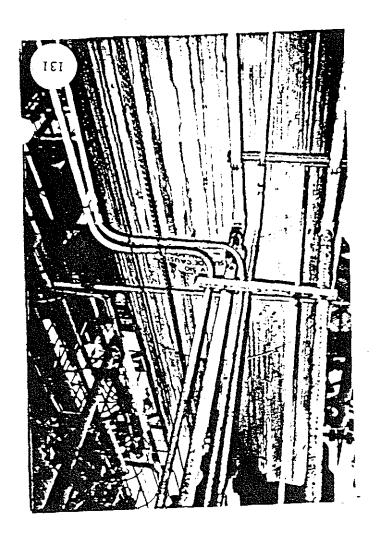


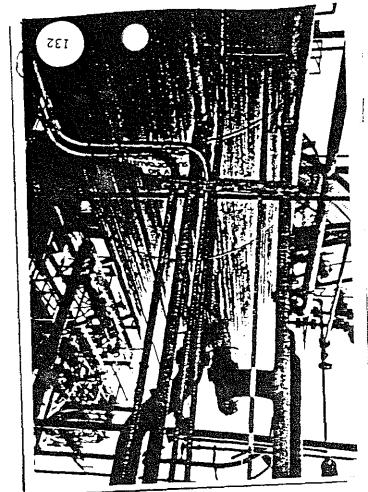


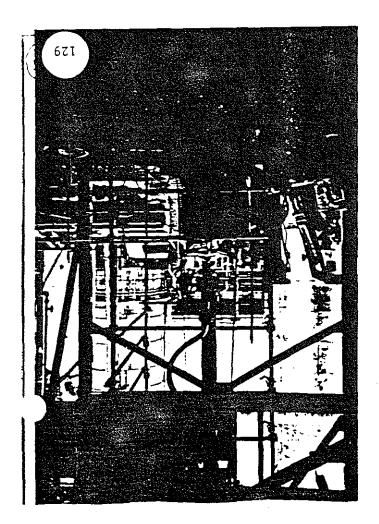


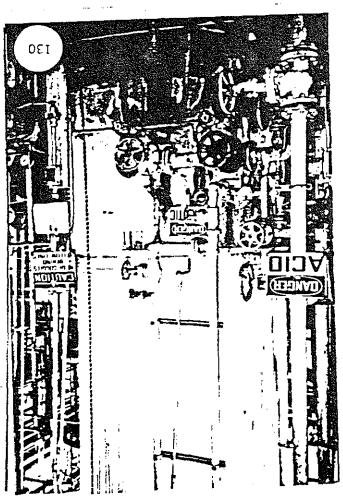




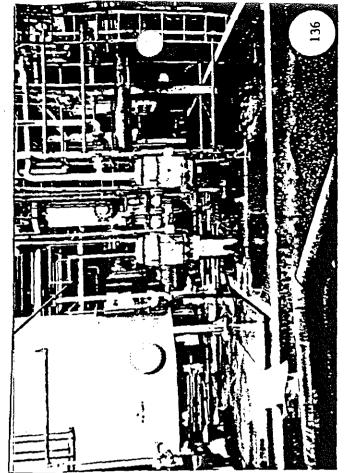


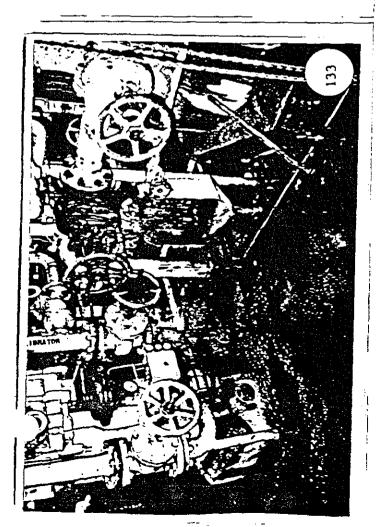


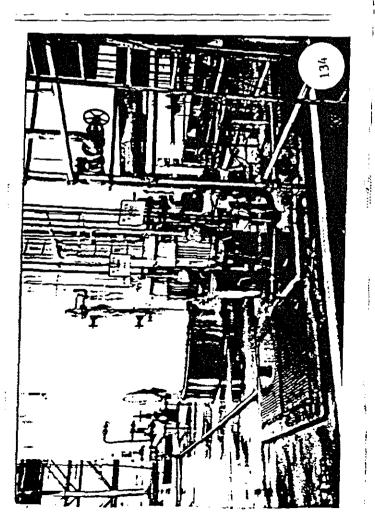




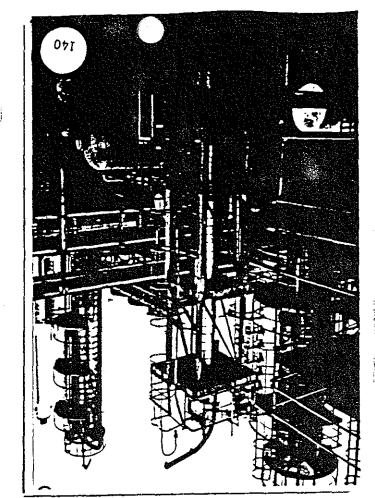


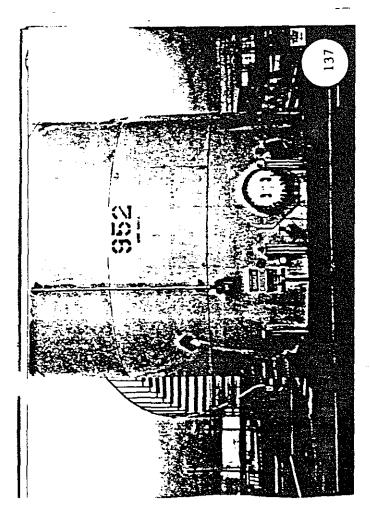


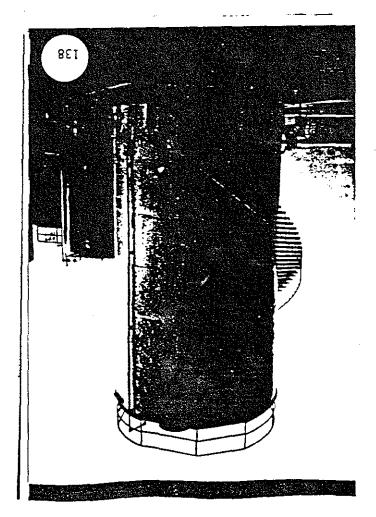


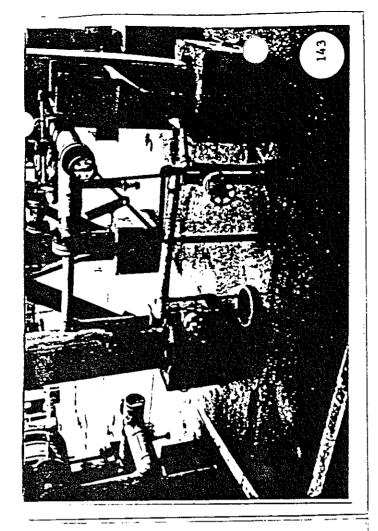


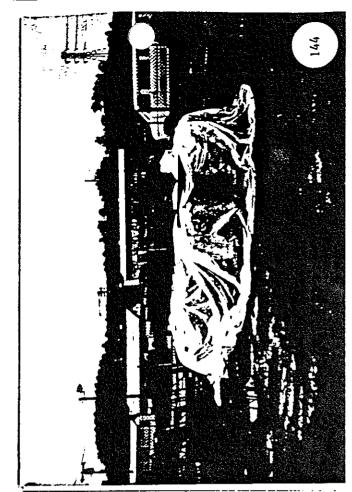


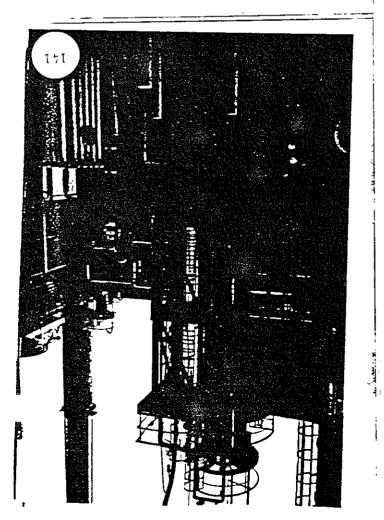


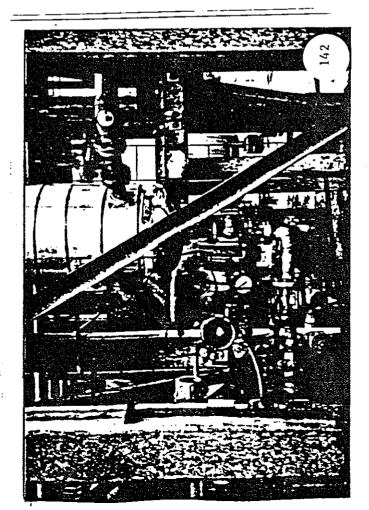


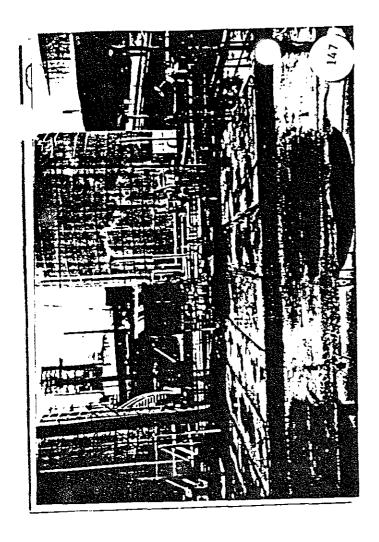


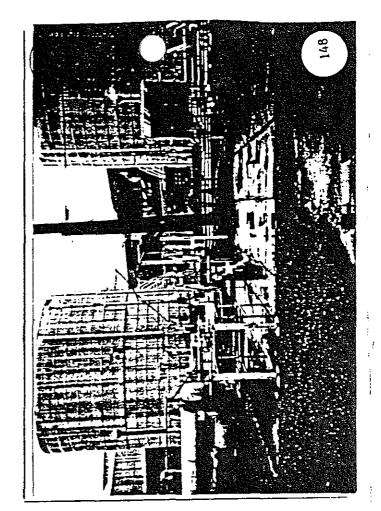




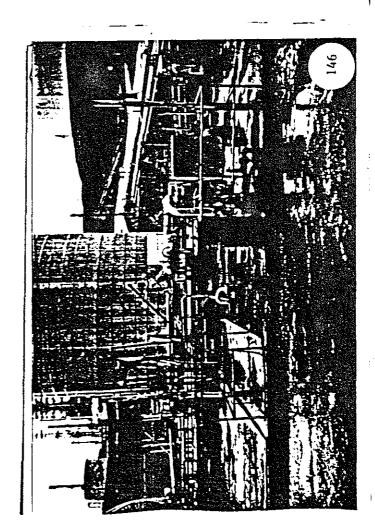


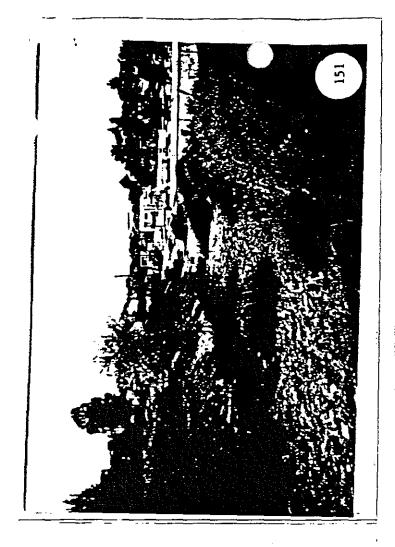


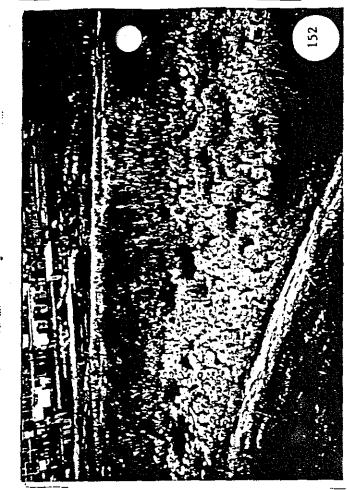


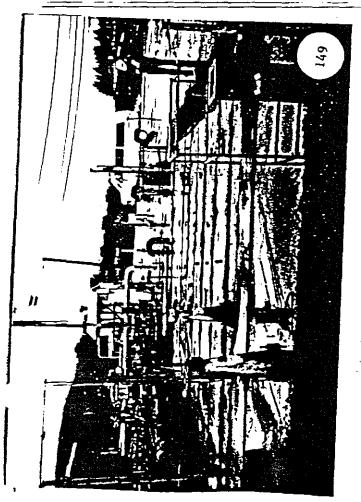




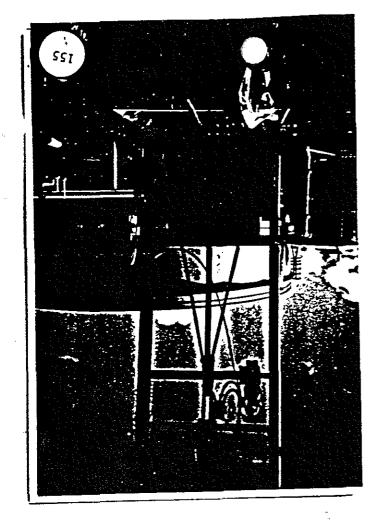


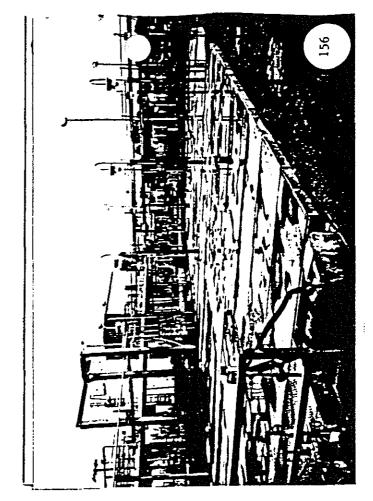


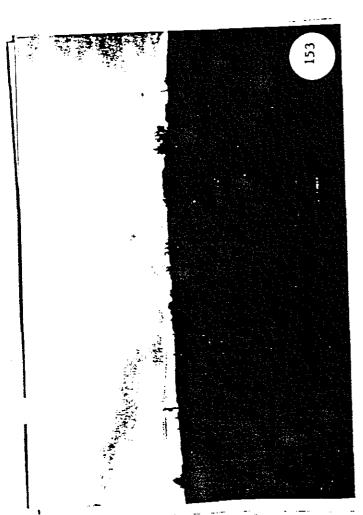


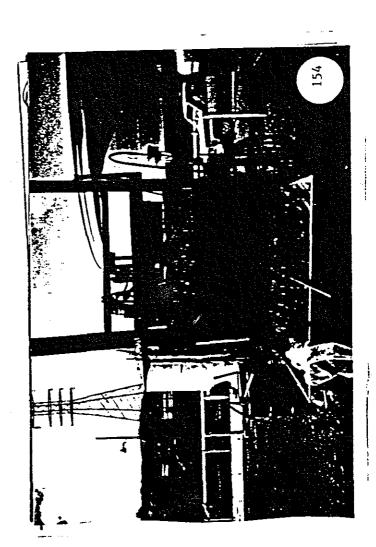


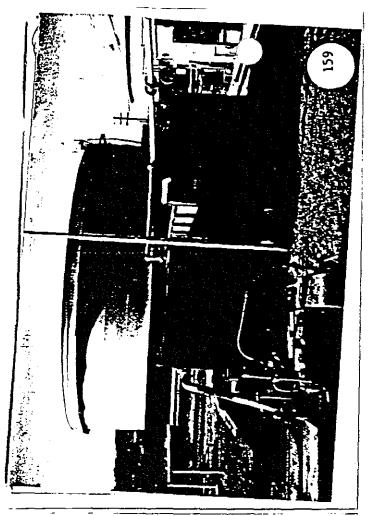




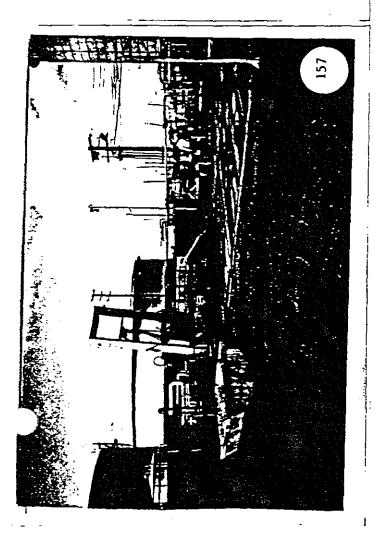


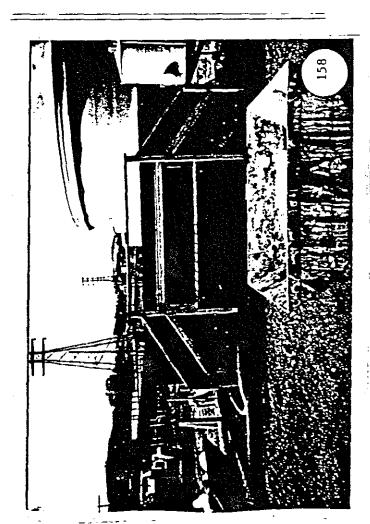


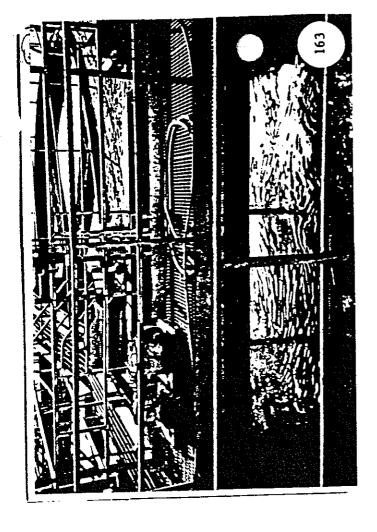


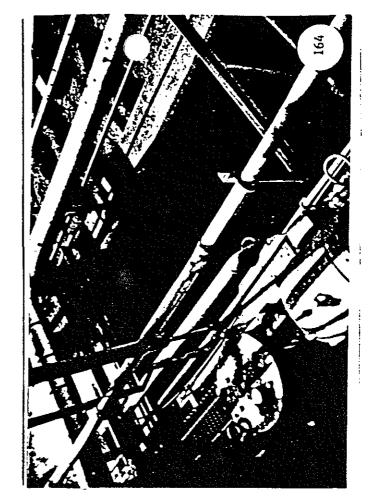


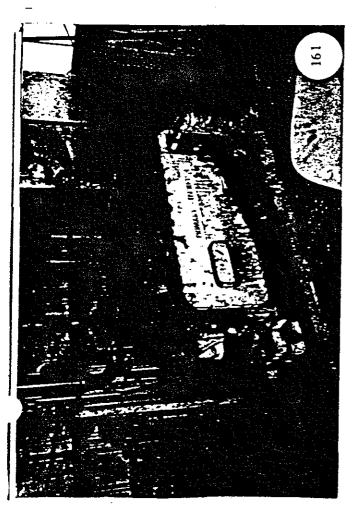


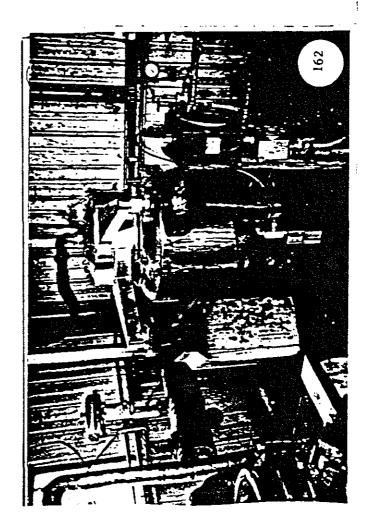


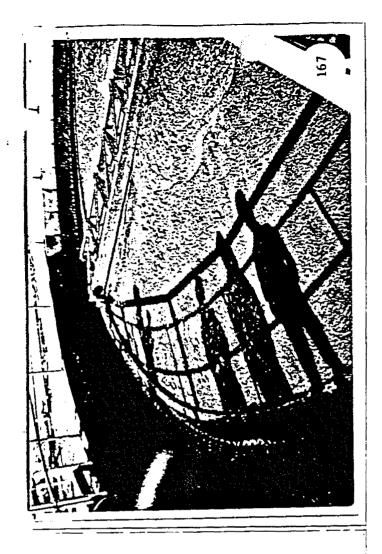


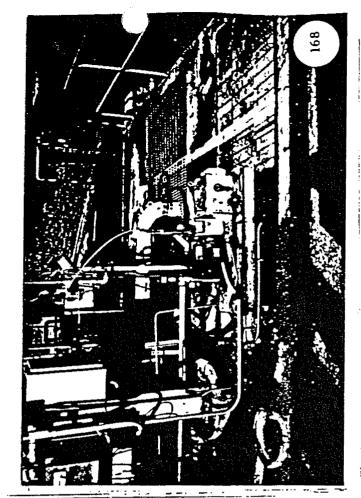


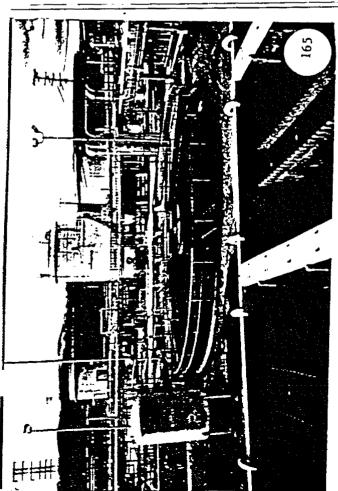


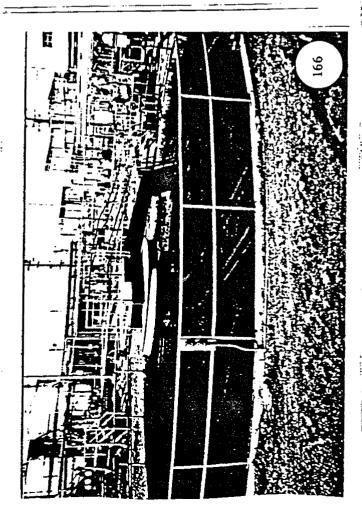




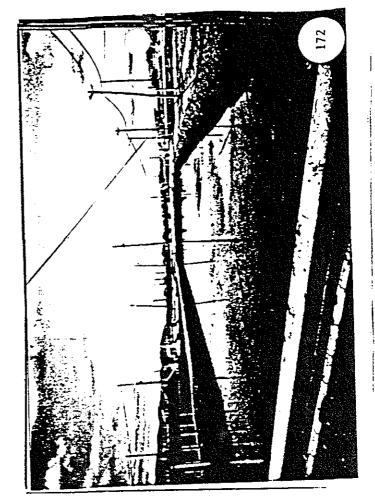




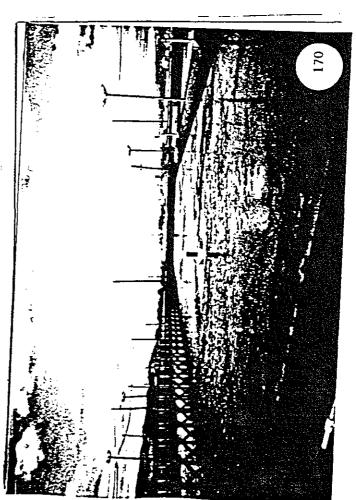


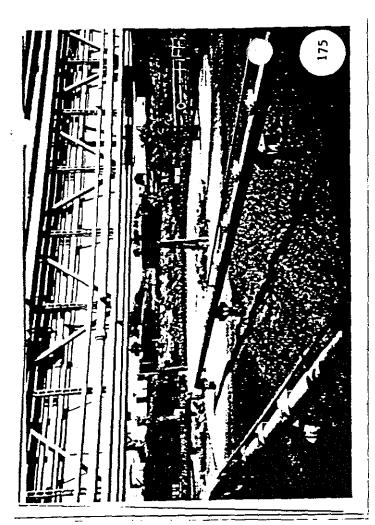


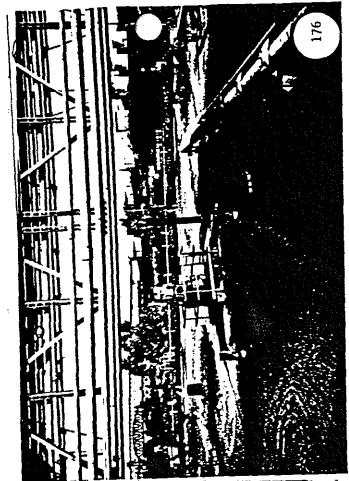




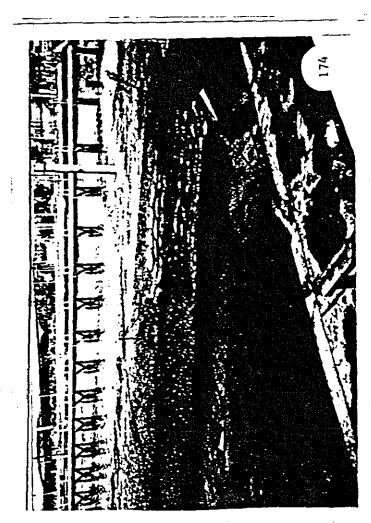


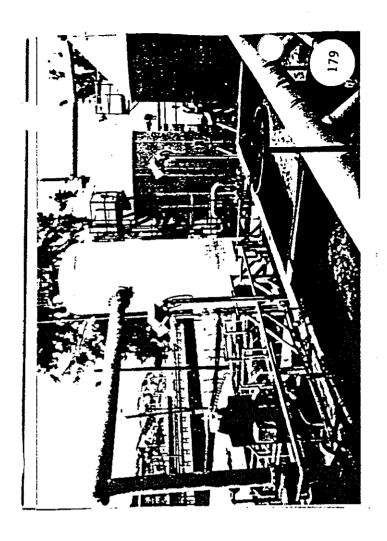




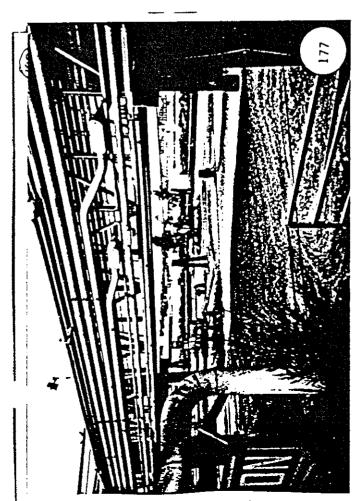


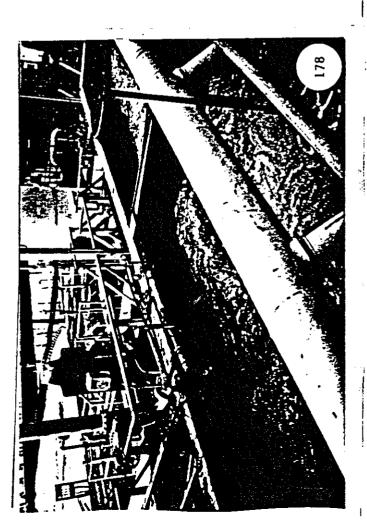


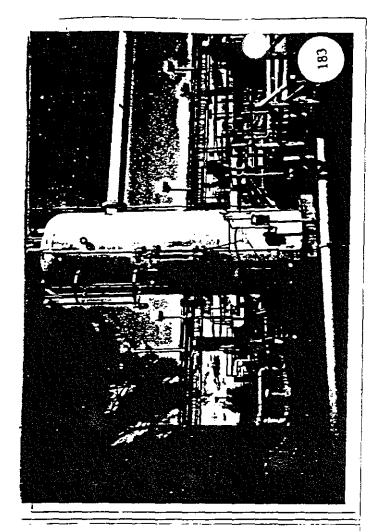


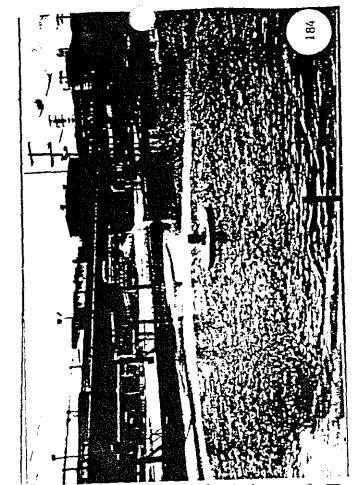


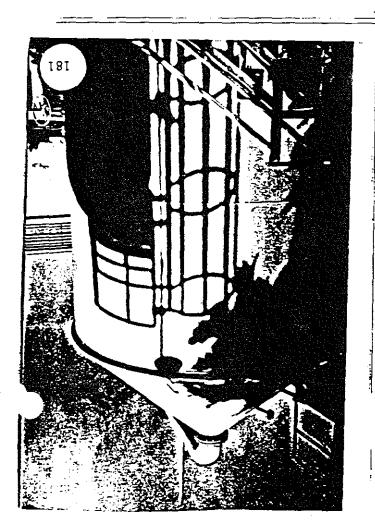


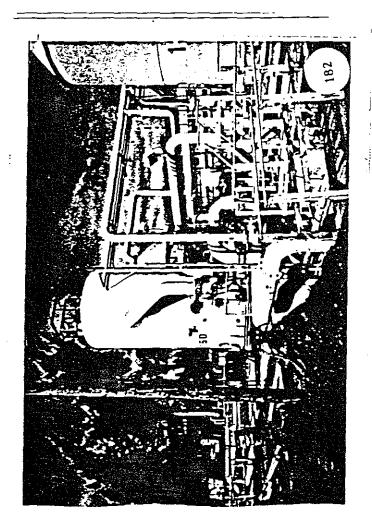


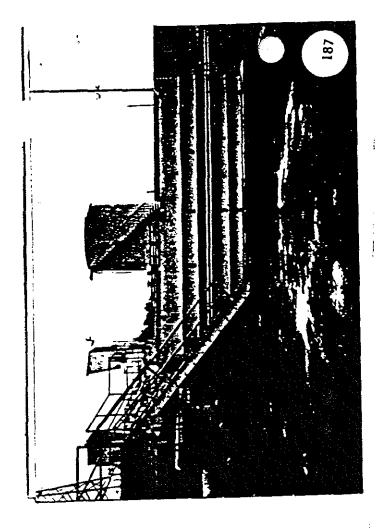


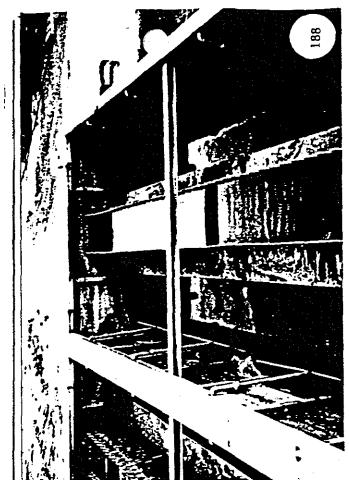


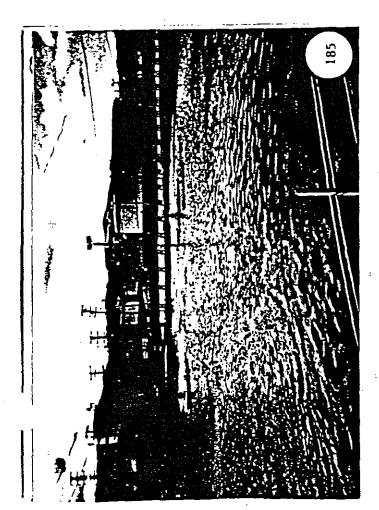


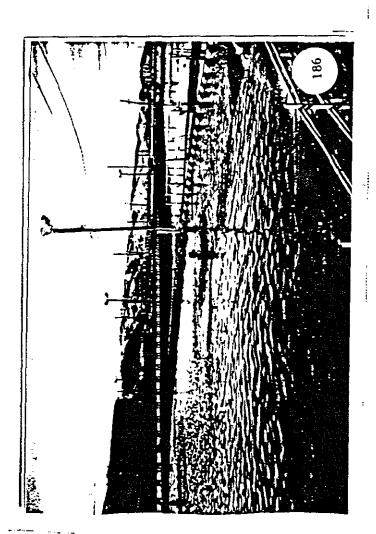


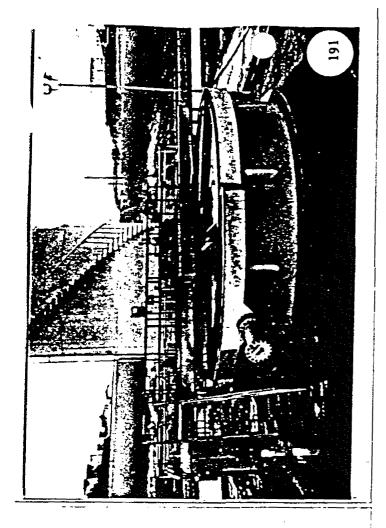


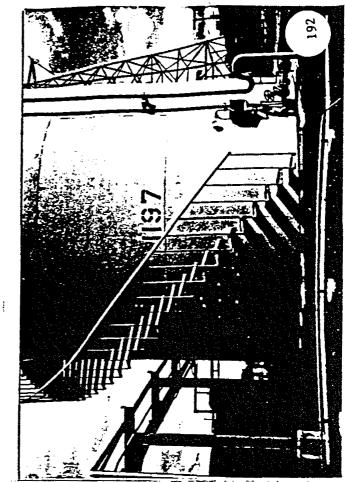


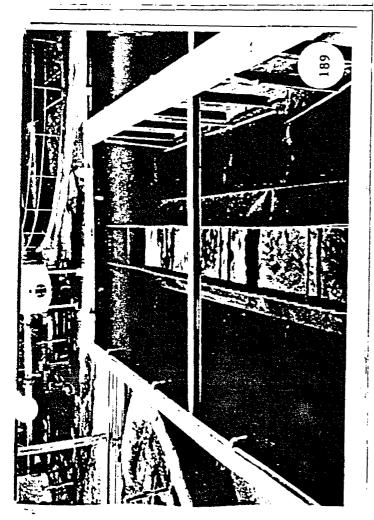


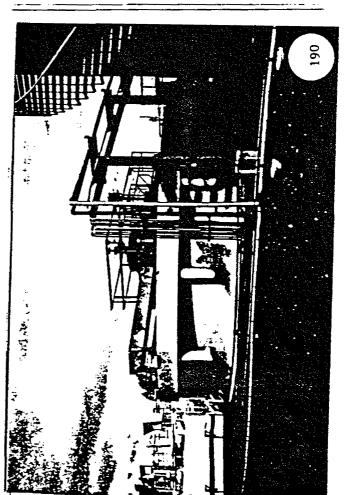








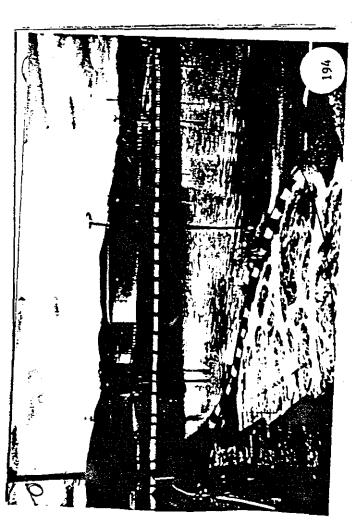


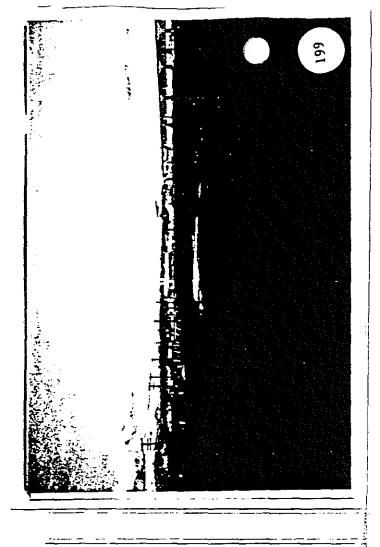


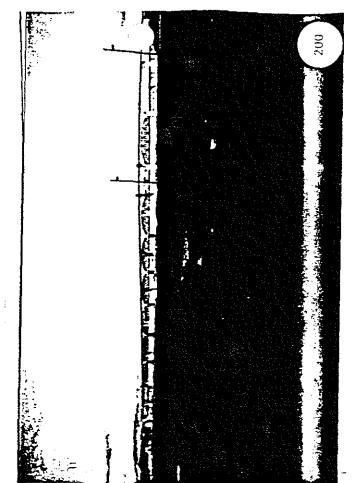


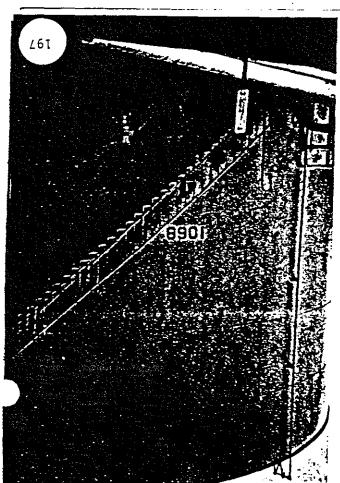


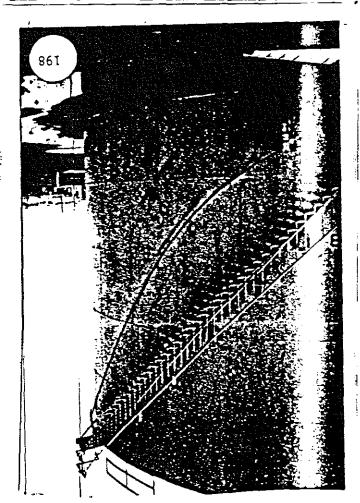


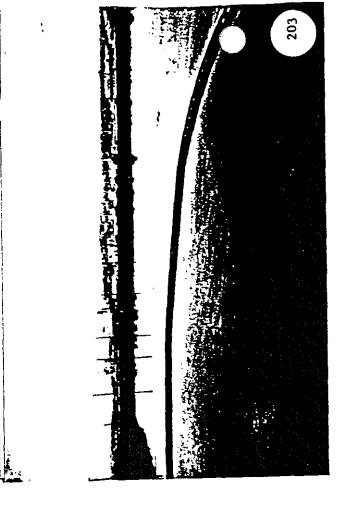


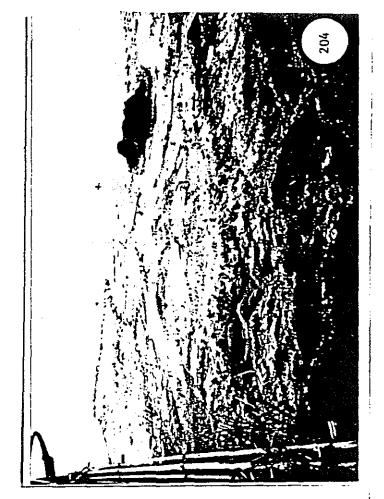


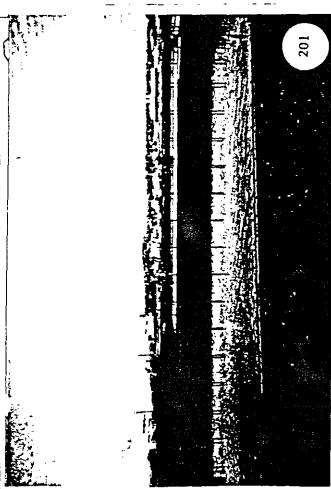


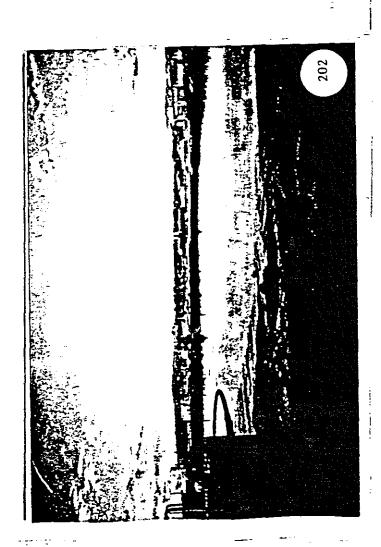


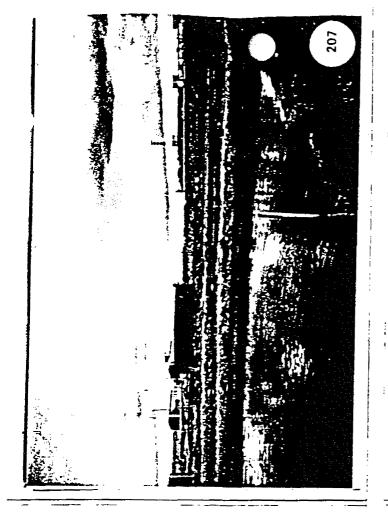


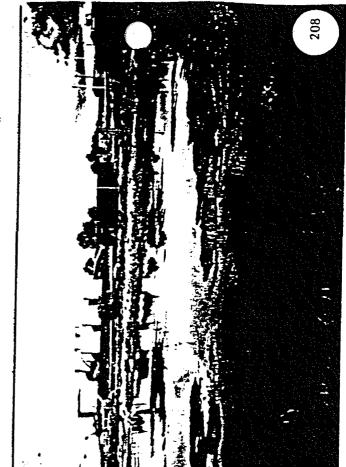






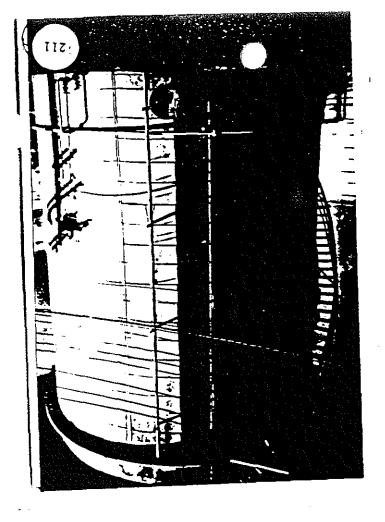


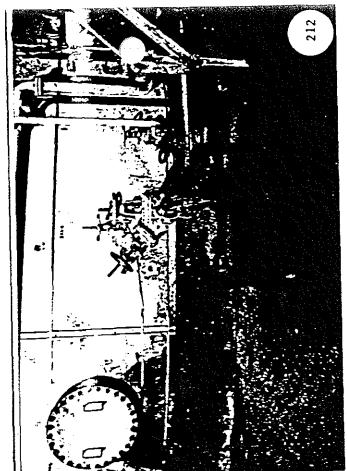


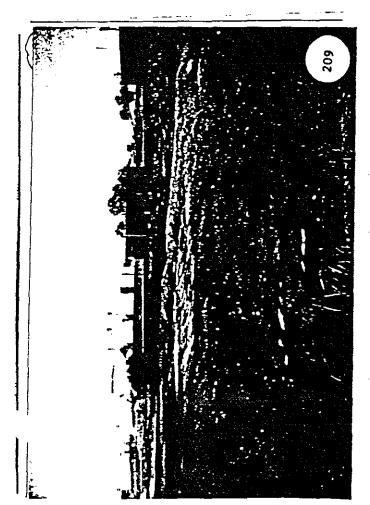


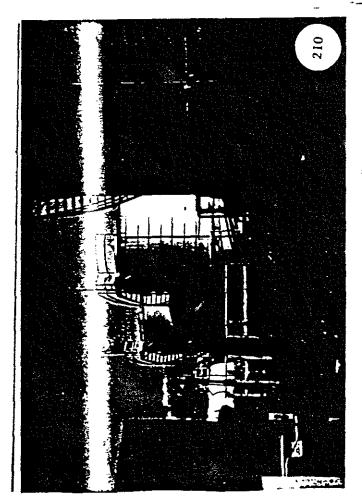


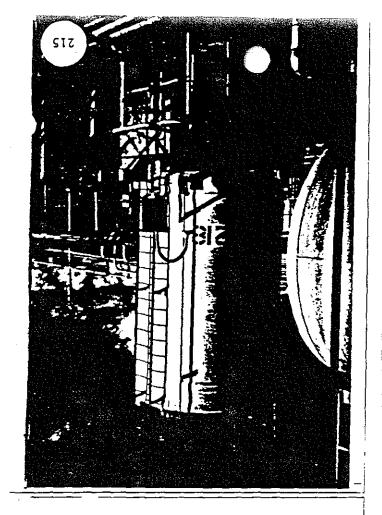


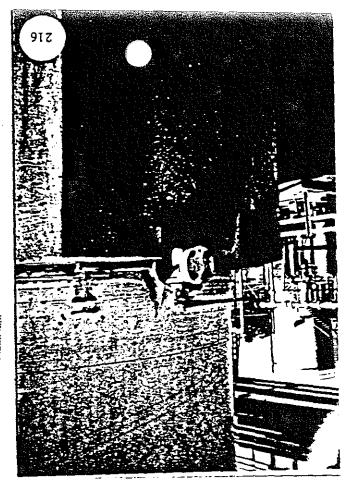




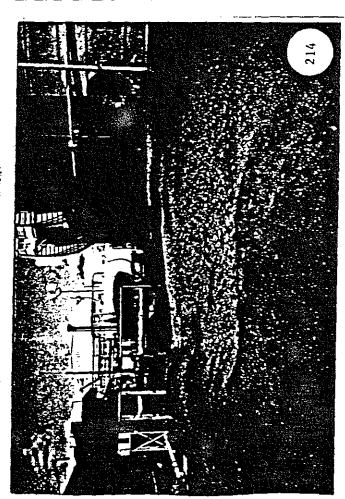


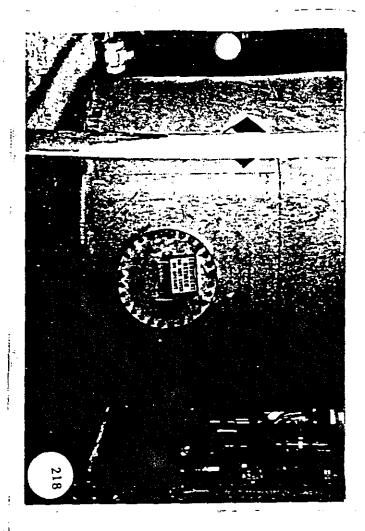




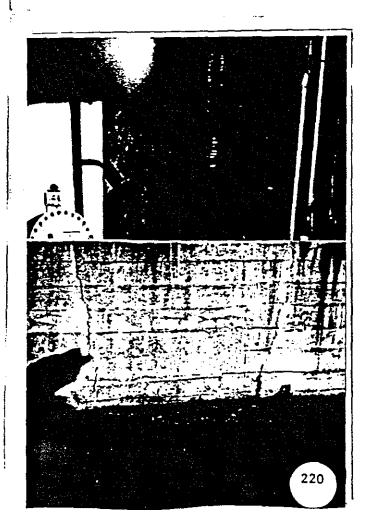








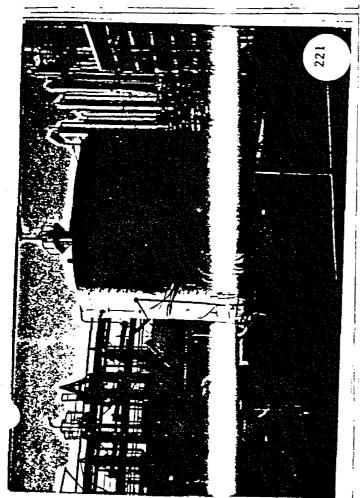


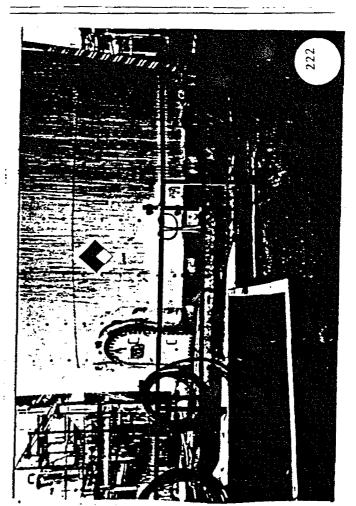












Appendix B

FIELD NOTES



COMPOSITIONS

Shell Montines

Shell Montines

Shell Montines

Shell Montines

Shell Montines

Plant

Shell Montines

Shell Montines

Shell Shell Shell Fort

Reported Work Discharge August 1987

Parfie Former of Groups

- = information needs for handfill unit are addressed for the mot part in the atrue three regards

on attacked Aformation Med Sunracy lit

Which wash from the least of the for 6.0 MGD

Come out to 4.5 see Dan come but to 4.22 su Dan Come back to 4.23 see Dan units 441 through 4.45 flour ocherstic to be provided Spent Caustic Newtralization System" unit 4.45 construction detail to be provided. Blenhal S'umus 45.1 (Judy morred to eddress & rolongrowned by stell closed efter ground water on found 456.3 - Since ao 4.51 4.56.4 - ASD Filter ake - Mirron to provide date 4. Conseponder on deformentor as mon hazardous 4565- not on revisit But A of Trov. 1931 456.6 - talenout ; service in 34/35, cleaned, not used series 4.56.7 - Hodogu reforme purale, oxazolidone burned for heat value. 4.56.8 Tark 2197, out of service, cleaned Tank 912, pH control 4.569 netter to EPA May 1, 1997 requesting deletion from About A of several units

11/12/87

4.14 see Aport of waste Duchange in before and after tops for fill depth

- they fill contain neptle which are believed.

bice well fixed to the classes

- metal could have come from the could onl

or from the cruding catalogs

- sel clay fell come from lubrandon production

note tack on cite are seeing prospered out.

4.12 see Report of WD for covering of execution

for construction of sentes 1256 \$ 1257, also contain

considering of series pron to construction

- process & storn drawing with term are conserved.

and routed & weakfulte treatent prility

4.11 See Roger of me covering of fill metrics and topo acid studyer to lead aludyer.

- before from cause oil strange tank; not and other freehand components and expend to oil

4.10 fine line to give line tar studies Rq WD for details tank betom studies, and 4 toxic

su printo long

4.13 deseturted catalight in pordo (6)

- see RojuOga details

- permetted NPDES on fell when the cuit was in execution

- ofthe treatment the decentrated estimate abudge was

- project down dan (concept) in a of wa
- ground water monitring underway
- study still in ponde

4.16 en Rojwo for details on original and awall tops upto ite. 30' of file

- oile vale temp

- drell don ocross small villey

4.7 terepal clay handfill

al ROWD for citallo

- same meterial as 4.14

- major sand blooking activity

- over burden so clean fill

4,8 tengel day landfill

- en Rg ND fr. debato

- much g the fill slick ento the late about (4.21)

dering a teamy comple in 1935

421 storm water - upper lake & Lower Lake

- storm water devented from LOP Area

- pumped from her to warkersh historiat plant_

see Rgwo and Dame & Moore Report of Lowe 17, 1987

(TRIA Report)

Toxis Pris Cornol Act)

- overfort maken waken come

- upper lake not connected to labor lake, overflow to to the lower lake - lower lake receives rungs only

4.2 see RyWO for details

- tark bottoms

- wask excavated for coontruction of tark 1161

43 see Rgwo go dehato

- time politime of seed studge

- leveled and parcel (parting late)

ner vers coroso Mand the class and

under a small find of the marketing plant

4.17 collection for tank leading pourpue nurgo from
lieal theel oil first from on Crude Hill

- currently receive storm water only

- drains to waterwife treatment

- see Roy wo fr- sistands

4.4 ort draw villenter screep from old vaccion revenspendion - some quentor by Merion Conner on this
- pee Rg UD for delivere
- currently used for few training

4.6 see RZWO for cietails majo- referring development over- coke ____ disposal area. _ trunto A & B 454 they werte incerenter storage turk 432 -tolvere carrier for product or gar phosphon comet 7 7-17 : consulent spec gentity / all stains from this area go to treatment system - produced by Ehell - no secondary containment currently will have by 1998 deadline 4.56.4 ASE alterake box material no longer considered horymlan 4.55 Hong waste neumation with - eddresed in detail in Part 3 germit. August 1983 - location as shown on our map.

4.22 Corregated plate in tercepire 4.23 Cpi waste bis CPI dimpsky box - corrugated plates removed, now just a large skunne tank - studge pumped continuity from stenner tarkage to above ground dumpston tanks for settling and of sleedye and abletonel skinning - the sludge (cole) is batched out of durpther tank and taken back to decorbeing presen for recovery - the system storacle alleknul nearing after - worke returned back who CPI - oil you to grow oil separate material for law soiler goes to only code surposel

- under flow from CPI gos is waste water treatment

49 see RAWD , x sixub

- overly leased by Genter

- over burning of troch & some Cal continues.

- paved over as parking lat

- ground water montring.

4.13 Has aute Orum Storay Isree

- isenfall rungs from hellseile behind streege over enter streege over and floods the cuted tream to the prost of overflow - pepe and value located in corner of curbed basen to allow cleaninge (namenta).

process/otom sown drain

il contamention of est, appearly the process

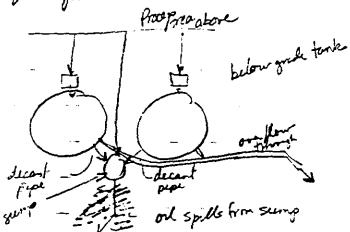
drain is open at this part of extent to back flooding—

top of paper cut open at several points

covered, curbed, looks good 3 drums of wester I drum of cleaning makerial

4.5 o'l drain collection aung - und for crank core drawinge veryte by same recollection, I don't Hick so looks like them two cureles rank (720 Map x 15 dis) were party a sight to decan't will off ort - the storm drawing or some the process flow - one actue occurs drain passes through

part of the system or stout using the tanks
- our flow from the even sever a much in surfame



Hay who done some
4.19 - Asberto Suporal bin
- mon kez delris box
- Storm chain fiel to person sewer
- Alera alcaning com whom
- noveroff consument for the entrience
- runoff to the area until go o vices
deaned is the pre sim sewer
4.48 work feel is co Foren
DA = float
Bio 2sleds
resionday comme = - plan zulmittel = 0-5
blum subject to rever - per res Emily rege
V • · ·)
slam to be necessaried is also be by 1991.
of the Newser is a significant of 1991.
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rig dead. - The told revise in a sure of the services (softens) - prolected could all the services to be not has.
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rig dead. - The told revise in a sure of the services (softens) - prolected could all the services to be not has.

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Booler lo Tel - With Area (see New)

4.49 CD Doiles (3 torin with

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50-largers - 1 soil are en me.

population - bes 8:

consult amont of mobil

- storm down to the real got the eff wanter the

reals of flow is, for horizon of appoint

- 20 thing water of be in a down as to wante

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largers of the conditional and the

largers of the conditional and the conditiona

Sulfer is sy face

buffer is and set po f = 511

bushe is a for a min as a form of the service o

apret a still don- who was country is used knock out is not always or line -510 \$511 are stacked (511 or be som) - closed pepin, intern, see plat problem country sump - Il wan a pere perent wahent Courte sump is also male, covered, high level along controlo purposey, vie intend by 12" bent, drain within the treum Each proces area has a control value on the peocles ___ seum to wolth major spring ordungs Tank 952 Sent Surtr Holangton le 12" bern with grees draw wade the bern 75m 752 Sport courte ques po gent contra retralique ___ Each coustie mentioning francis closed process pipers, to vessel, no bern contained. it shots for locking counter to some

potential SWMU 4.56.7

bag stoage for continue fly an and fine from
bagging operation (4.50)

- interior facility

- stocked I high

- succeedite of to 40 bags

- plan call it segant me fement restriction)
burned sordette sid star a session service
- Stepped to lien idea latter Hello

4-20 Grade Ol Separate 603

- in ground covered duringe
- oil returned to reven
- settled orlich removed secondeally (once payon) taken in our to Ketilsmonthells
- mo cisse on other in-sinsely process area

 Therein) are very one deveted to the upper

 Lake (4.21)
- adjust prosession by para charments eggen between the construction with out 5kming out to GDS

. –	4.50	. Z				
	Glu	dy Teneses	- used by i	961E for	ith	
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	•					

4.25

1/3 of referency weekend leave sines in

from the orly water peopless

Ear Screen to LPI Sepands - Muhrely tim

polytom to sind Eax

decent

4.27 Eard Ears (2 in series) (one standay)

- tomal continues

- boxer court of steel tanks a goods

4.29 We Take Spect on and

- on ground arousk boulance

- un grown of concerte food one

- claufeur and newtratistion terhage to in a contained

Les is as

4.30 Ar fisation Clarkers

4.31 PH adjustment - fash mile

7.32 3 MG equilython pord Pondo_3 X4

4.34 cotreta 4M6 reach.

300 mg/le 800 influent

>10 mg/le 24.

- gertage poul with

- gertage seentra

#35 clarifur for bus breaken

18 Stage concerts furtherse stone grade and closed

sight shell factor for and beard an extraction

2rd clard shell factor for 18 store

bushe underfor for 18 store

bushesh effect to holly pool

4.39 Sand felters - from holly pool

motion use all of the fine

mot much during the

curtch to polyners reduced the much for sind it is

42? intrafige for oil recovered per the API

- not used since 1979

- ben was used for dryed oil making

Study thekener used is tertion whose schoolings studye fank 147 was used to site it itemed studye tank 1197 is not in severe , used to manage haf add womentry theokered studye now gree to 1065

4.59.4

Tank 1068

- was used for sport courtie.

_ nour word for coke slurry

- endera of west soil one sample look of m lyWD

gent out to the second of the

. . .

and the second of the second o

- Surrounded by low bermed area

Pond 6 - Par to adares flow norting

Eallat ford - next to fonds

4.1 Snacker land Trument - but for sleedy treatment but move used

see RejWD for deforite
- mended for decastering poord colorife. parch 3 +
4

Junks 1063, 1004, 1065

alfor poil - 1063 - 1064 Perun to Crude Jost

water back to API

contrafing sung both

all confirmed in the game berned asa

at the treatment plant

1065- pivstelds and OAF flut

- plan submittel p permit - neur bern on with

- New boun will would that 1064

4.568 fail # 1218 spent and used fr. pH adjustment at treatment plant - vertel tank - are greatly continued by drawer terish into treatment plant sewer See requesting letter m 1987 & DASEESE 4.56.6 (tank 881) Ally chloride - punseally taken out of server - waste moderial - used by a chanceal conjuncy as a mout material - listed in Part F., leter taken and of currer and on triggs get it of the Part A asso. - confaired with other tarks on a beined once (3' concrete well) with draws to the process server - Sullaw bern (3") ouce one Unit RZ terk 218 - opentaciel which was set to Stauffer - requested to be removed from Bot A - And not have been on Fort A, exerction for Melon - permently removed from between



COMPOSITIONS

Shell Martinez

-Bill Hahn - Field Notes -Litigation Potential - FOIA Exempt Bill Hahn

Field Notes

Shell Refinery

Martinez, California

Nov 11-13, 1987

(Nothing else this page)

4/1/81 Shell-Martinez

Hirium Conner - Enu. Control

Jane Focker - Grondwater Program

Judy Hoorad - Enu. Conseru. Mgr.

Bob Bowen - Tech. Superintendent

Waste site study previously done in 1986 Required by State law.

- Only carrently active site is for clean fill storage.

Ba, cr, Ni, Pb. and sulfates common to most sites.

Plant feels paritially due to background, not yet documented.

- Requested data tubles to determine detection levels for background metals identified above.

S. Sussested we review full 4 volume report

series for Hay 1989 site characterization. Ponc

anti submitted subsequent to original file

search.

- (R) Harding howson study done first. 1986
 - 83 Sold Waste Assessment Study (Incon) 1/87
 - R3 Report of Waste Oiseharge (Pacific Env Fromp) 8/87
- 84) Surface Impoundment Sumpling and Analyses

June 17, 1887

Landfills are subsurface operation.

Land treatment is surface operation (material is later removed after treatment)

None of the landfills are lined

Berms discussed in R3

Closure procedures may be in R3 but still being negotiated with Water Board

Chemical Analysis not done at time of discharge. Analysis of material in place

is in RD

Unit 4.16 - 1981 constructed wherehouse over this site. Filled in paved over.

Determine Source for reference #1 (SAIC Report)

re contaminated soil blended with clean fill.

Unit 4.1 Area "FF"

Stormwater impoundment during heavy
rains. Water later reprocessed.

Closure activities in ROWA report to be
submitted Jan 88

Arca 4.1 (contid)

Only execution was to remove shadge Slurry wal installed around antire area to approx 5' depth 1983?
Used to downter dredsings form from effluent ponds.
Verification of sludge removel advessed in (R3)

Area 4.15 Inactive Ballust Water Fond

Add cssed in Ticpa Report &

No information on operations when used for ballust water
recovered ail added to slop system
then added back to crude.

Now known as fond #6 used for stormwater
retention.

Bullast water put back discharged through plant treatment system

Area 4.2 Fross Oil Separator
May not have bur screen

Haterials from bar screen (if any)
would go to offsite landfill.

Hay be some analyses of conventional parameters pH, Toc, NH2-N

Tristalled 1966

Cement slub cover

Unit 4.21

There is overflow from Frozs Oil Separator
but not used now.

Construction and location in RY

Not discharged to dital unless stormwater
retention capacity exceeded. Dital is

permitted discharge.

Collected oil goes to slop system

Collected oil goes to stop system

Pate of startup unknown (Hid so's?)

No liner begins discussed in RY)

Includes 2 ponds

Unit 4.25 API Separator

Was has date of startup

Solids removal is continous

4.25 Continued - 28 August 1985
Radian did study of API separator
for EPA (In files at RTP)

Blow grade 2 cell unit. Covered

Concrete construction

Startup 1962

Unit 4.26 Tank 1063

Steel tank

No information has been submitted

Recovered oil storage prior to being

returned to crude oil

Takes oil only from

5,029 BBL 30' \$ - 40' h

5,029 BBL 30' & 40'h
floating roof double seal
Water drained back to system
Startup 1962
Surrounded by dirt berm
No sediment removal

Unit 4.28 Contribuse
Startup 21862 Discontinueb

in building on concrete pad Discontinued = 1980 (luta)

unit 4.29 Westewater neutralization unit

(Flash mix tank)

Acid addition to mixing tank

no skimming

Started \$\approx 1962\$

eff pH > 10.5

Flash mix tank and DAF units all within dirt bermed area.

Unit 4.30 DAF units

2 parallell units

Q = 4 MGD ave 6 MGD max

either unit can handle dry flow

Skim to pit on a itimen

Startup = 1962

unit 4.31 unmixed neutralization tank
raises pH prior to biotreatment

Unit 4.32 Bistreater equilisation pond(s)

actually 1 pond with short baffel

By for analysec

No liner Bermed I day detention

last cleaned in 1976 Sent to drying Bedi

Unit 4.33 Emers Holding Pond
used as shock pond

(R1) Same as 4.32

Unit 4.34 Bio unit

2 i day detention

Startup early 19705

Chem analyses PY

earthen besin bermed

unlined uncovered

Concrete pad

unit 4.35 2 stage clarifiers

second stage float back to _____

pond

unit 4.36 Sludge Thickener

Takes solds directly from

pond not from clarifiers

water goes back to pond

solids to Tank ### 1065

or to 1171 for storage.

Unit 4.37 Storage Tank 1193

concrete pad

no berm

located next to Sludge DAF

unit 4.38 Sand filter feed pond

5A can overflow to SB

if sand filter cannot key up

converted from original lagoon

to feed pond in 1982

Chemical Analyses (RV)

bermed unlined uncovered

Unit 4.39 Sand Filters

Startup 1983

concrete pad

no berm no cover

unit 4.40 Final Hold Pond

normal practice not to discharge

during slack tides

controlled by velocity sensor

practice not considered necessary

and may be discontinued

Unit 4.18 HW Prum Storage

Most solid materials

Toxic due to metals or oils

concrete pad not conted

concrete curb not covered

no known spills

no known drains or sumps

drums stored on pullets

Unit 4.19 Waste Transfer Station

Used for storage of 20 xd bins

as bestes bin

sulfur bin

non hazzard toash bin

limo bin

no berm us cour

Unit 4.22 Plate Interesptor

No flow information

No chemical analyses

covered concrete slab

not in berned area

Unit 4.23 CPI Waste Bin

pumpster to recieve

bar screen trush

Since 1963

no composition info for trash

unit 4.24 CPI Dumpster Box

recives solide from CPI unit (coke)

Have analyses of coke which

is generated

Contractor disposed by contractor

contractor owned vacaum truck

roll top bins

placed on concrete pad

Unit 4.27 Sand Box

Bin tohold Solid. removed from API separator

Metal bins (24000 sal capacity)

Flites remove bottom solids

continously added to bins

Boxes installed = 3 yrs ago

Data in API characterization studies

on dist no berm

not covered

operator manually switches when

Bins fall

Sent to offsite landfill III IT

now thom weste Hamt

may dewater in future prior

Unit 4.41 Sulfide caustic flash pot

Accumulates caustic from

treatment of cy-cs hydrocarbon

streams

Steel tank

Startup 1866

He chem analyses

on concrete pad no berm

Writ 4.42

Performs same function as

Unit 4.41 during high flow operations

C4 and C5 hydrocarbons flash

to flare in 4.41. Heavy He's

I gasoline) in 4.42 will not flash

Recovered gasoline sent to alkalation unit

unit 4.43 Caustic sump equipped with high level alaran Startup 1963 receives caustic from caustic sewer system sources include 4.41 and 4.42

Unit 4.44 Caustie Storage Tank 852

recieves caustic from caustie sump

relocated from previous service

previous service not known

on concrete pad to concrete bern

Volume 2019 BBIS 20 \$ × 36° h

Startup 1849

Present service May 1981

Unit 4.45 Spent caustic neutralizer

Startup 1966

Ho chem analyses

concrete pad

ho berm

Also includes steam stripper

to remove crysillis acid und phenols

then to son water stp stripper

Unit 4.46 PCB Storage Area

Adjacent to HW Storage area

concrete pad expoxy? coated

concrete curbing also coated

coated because of concrete crack?

trash contaminated D PCB

empty capacitors

oils containing 10070 to Storage PCB

Unit 4.47 Storese Tenk 1065

Receives 30 Tons I day DAF Float

100 " " Bio Solids (Wet)

Analyses in Revised Part B Applie.

Submitted Hay 1, 1981

also in API waste Study

located in dirt in berned area located next to 1063

Unit 4.48 Tank 383

on pad no berm

receives waste from 1065

pumps to incinerator

constructed 1942 1925

Changed to this service 1981

FRP inside

unit 4.49 co Boilers

RCRA Rogulalated as are Tanks 383 and 1005

Operating conditions in co permit

Unit 4.50 CO Boilers Past Bin

Hopper for fluc ash

from 3 co Boilers

Steel Hopper

Imput is continions

Startup 1266

Analysis available

elevated above concrete pad

no berms hopper covered.

Unit 4.51 CO Boilere Pumpster Box

Hopper was connected to Dumpster Bin
with value normally left open

As of last sammer Dumpster Removed

Material now bagged. Due to fine
nature sent to Chem Waste Hymt

rather than landfill.

now bass stored on concrete pad

intend to upgrade area.

Unit 4.52 and 4.53 located at Shell Pittsburg catulyst plant which has separate interim status document.

Unit 4.54 Tank 482

Hold waste feed burned in 4.55

primarily toluene

Frequency based on catalyst sale

on pad in building

wells no berm

unit 4,55

current operating conditions approx. 50% operating concrete pad no berm

Potential SWMU's

Unit 4.56.1 Disposal area EE Bought from use them sold and 4.56.2 PGFE Sludge Terraces

Test wells in place closure concluded Shell still ownes

Unit #153 4.56.3 Same as 4.51

Unit 4.56.4 ASD Filter Cake Storage

Information Submitted this summer

that material is not hazzardour

2 10 cm yd bin

covered bin

Unit 4.56. 5

Unit 00 reneed list from 2001 1981 doce not list Tank possibly an erronurous entry

Unit 4.56.6 Organic Chloride Waste

Out of Service

Tank has been cleaned

Removed from 8UC 1984-1985

Ally/ Chloride storage Tank

Will not be returned. to service

Unit 4.56.7 Furnace Floy

Hydrogen reformer furnace.

Burns oxazolidone wastes

from the sulfinal stripper

Unit 4.56.8

Tant 218T taken out of service between 83 and \$5 and \$5

Unit hh (Tenk 1218) not sees 912

contain spent acid used for

pH control

located at effluent end of

API separator

Since Hay 1981 tank
4.56.9 1868 contains coke slurry
which is recycled back to coker
and is not a waste therefor
Tank 1068 not a SHU.

Statement about 1064 is correct theefore not a SMU.

4.56.13 Catalyst drops are tempory stored

Since they result in 200-2000 drams
which would overwhelm dram

Storege area. Do USI tommorow.

End of 11/11/87 Conference

Unit 4.14 ("DD")

Used to store spent clays

material contains some metals

only Hm. found in groundwater

also used to store clean fill

any harxardous materials hauled offsite

PAI to east

AZ E

AZ S

AY S

AY S

AF SE Overview

AC 9 "

AT NE "

AB Monitoria Well downgrate of area.

Unit 4.12 Luaro ("Z")

Excavated to clear fill to install Tanks 1254 to

1256

Area now clean, contains storm drain

bermed area

no evidence of releases.
4 Fas spheres adjacent to this

at the base of the spheres were approx. 6 55 sal alrums

2 drums contained water and some floating

sludge. Appearable to result from steam
eleaning of spheres.

Area 4.11 Layn)

Landfill for acid sludge and lead iledges

now used to store scrap lumber

Area 4.10 Lex")

Disposal for tarry sludge

and tank bottoms

Areas of discolored naterial

on surface

A white PVC pipe in the south wall of

the depression discharges water (groundente?)

at \$2.5 pm

This flows through a shallow depression

across the site iacl through a enlivent

and exite N side of site.

Discolored areas are large patches of hardened for like substance. In some areas material appears to have been discharged on the ground. In others it seems to have come up through cracks in the surface soil.

Area 4.13 ("AA")

All Abandoned Ponds

At time of use was permited NPDES discharge. G Ponds used to deactivate catalysts. Material added the submerged and removed after deactivation. Some deposits of white lime-like material on surface. No previous surface releases evident.

Area 4.16 ("N")

wes a pend. Filled in. Now used as a warehouse area. No evidence of release.

Howar was used to dump only water.

Area 4.7 ("0")

Was clay disposal area

now used for scrap material storage
and as a sandblasting area.

Area 4.8

Was clay disposal area

Haterial was orisinally on side of

hill between road and hake

Huch material ilid down during

rain storm. Haterial which slipped

was trucked off site

Area 4.21

Stormwater retention basin (upper)

Oil boom at south end

Appears alian

no evidence of release.

Stormwater retention basin (Lower)

Small pond

Iffluent structure is MPPES# 002

to small creek

Creek has been dredged and equiped with 4 oil booms

Area 4.2 ("H")

Within conrectly bermed area

Duz out and backfilled

Now site of large storage tank

Received tank bottoms in the past

Area 4.3 ("I")

Former landfill

Now parking lot

Area 4.17

Gully below storage Tank area

Area heavily stained with oil

contains drain that goes to

westewater treatment system

now receives stormwater

used to receive tank buttom

water at one time.

Area U.Y

harge valley that was filled in now used as fire training area and gravel storage several monitoring wells installed lubricating oil has been detected in some monitoring wells

There is no fuel storage in this area

Arca 4.6 ("M")

Now intensely developed area.

difficult to determine extent

of original fill area.

Area 4.54 (Tank 482v)

Vessel sits on concrete skirt in

concrete paved open sided building

tank is next to sewer grate

which gies to wa tewater treatment

Area 4.55 Excinerator "Z"

ASD Fitter Cake Boxes (4.56.4) not considered a haz waste

Area 4.55 Incinerator "Z"

4 connected units sitting

on a concrete pad includes

burner, venturi scrubber,

anoler and stack

no signs of any leakage or spillage

Any major spille would ascape

From the area. Unit appears clean

and well maintained

Areas 4.22

Automatia cleaned corrugated plate Separator.

Coke fines hauled out of separator into hopper (Area 4.23). Hopper is then expliced in Dumpster Bin (Area 4.24)

Oil/coke water separator initial pass through automatia cleaned bar screen, which is damped to Unit 4.23 Then thru a paralell settling Iskimming tanks. Skimmed oil is recovered. Settled coke slurry is pulled off and routed through (2 bing in series which allow the coke to resettle in the bins. This coke is then washed and sent to a plate and frame filter press after all the oil is washed free. Sunit 4.24) Note: Corrigated plates have been removed from CPI therefore just a separator leettler. Flow is > 100 gpm and > 5 gpm.

Unit 4.9 ("w")

leased by G.S. Roofing Products. Former burning ground now comprises parking lot and a portion of some low buildings. Honitoring well installed down gradulent. Monitored by

Area 4.18 HW Drum Storage Area

Subject to stormwater runon from

East edge hillside. Eurbing looks OK

Appropriate signs. Drain for stormwater was

closed at the time of inspection.

9 Drums of 3° But OH

19 At Drums slop tank waste (egsted Formate)

2 Drums of filter cartridges

Some deterioritation of curb on west

and south edge of area but would

contain any muterial spilled.

Area 4.46 PCB Storage

Small area under corrugated metal roof adjacent to HW Drum storage area. Enclosed by 12' fence (HW Drum has 6' fence) topped by barbed wire. Concrete pad and eurb. Some type of green sealer applied to eurb. No visible evidence of sealer on floor.

Ramp built over curb to allow fork

lift acess. (Same as HU Drum Storage).

Area now contains y Drums. Appropriate

signs. No evidence of any material

loss or release.

Unit 4.5 Oil Drain collection sump

Two large sumps

15' & 20' deep

generally dry and oily

to apparent use recent or otherwise

Area at lower grade shows avidence
of oil spillage from units

'Adjoining area contains "P-348 Slop" pump

water line next to pump has 11'h" canvas

hose running continously from break

in hose. This is washing continous

Flom of oil along abandoned pad

to swampy area next to large sumps.

End of Tour for 11/12/89 1730 PST

VSI Inspection Tour 11/13/87 31 of 43

Unit 4.19 HW Tra Ser Station

Area approx 100' x 100' surrounded by

6' chain link fence. Appropriate signs

Used for bin storage of as bestos waste.

Also contains approx 20 empty drums.

Area contains 2 storm drains connected

to process sewer. No curb or berm.

Any material spilled on ground would

go to process sewer.

Unit 4.48 Tank 383
Waste feed to do Boilers

Tank looks clean, no evidence of release.

Tank does not have containment. Next

to tank is 55 gal plastic drum marked

"Sulfurie and Hydroflauric acid" both

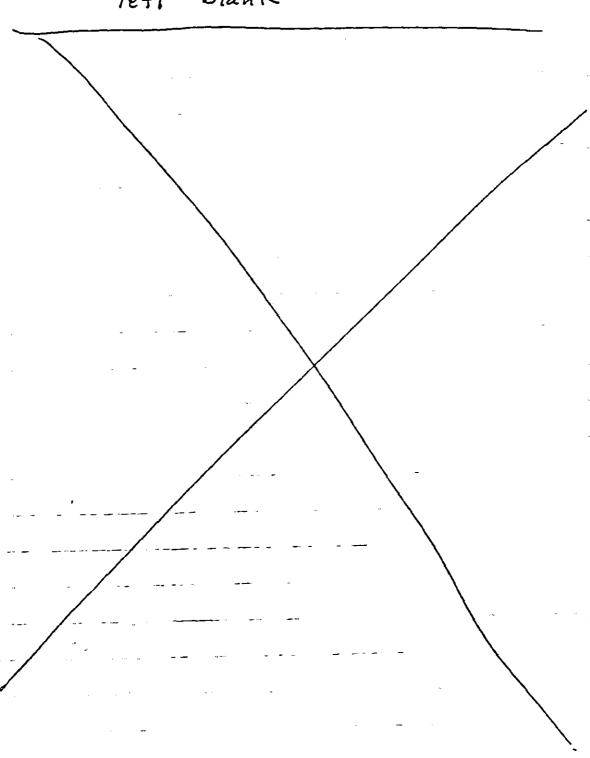
are located next to a storm drain.

Adjacent to Tank is lime unloading

urea. Evidence of spilled lime on the

ground: This will was down storm drain.

Page inadvertently 1eft Blank



Unit 4.49 20 Boilen

co Boilers a 3 large multistory units mounted on concrete pads. Units appear well maintained with no evidence of any past release. Such release is not judged possible short of chatastrophic failure.

Unit THE 4.50 co Dut Storage Bin This unit is a elevated hopper bin which serves all three boilers There is suprisingly little dust in the area, given the nature of the operation.

unit 4.51 The dumpster previously used to receive the dust has been replaced by a plestic bay system. The bags approx 5'x5' 45' are connected directly to the hopper. Transfer is essentially a dust free operation. Bags are then hauled off with a fork lift track.

Caustia used to desulfarize C3 and C4

HC and gasoline first sent to flosh pots,

Then to caustie sump, then Tank 952,

Then to caustie neutralizier, sulfario acid

added and steam stripped. Water goes to

process sewer, OH goes to crude recovery

system. Unit 4.42 used only for surge

relief of Unit 4.41. Then are operated in

series.

Flash Pots 4.41 and 4.42 show no evidence of - proin release. There is no containment.

Unit 4.43 coustie Sump

Below grade sump. Attempt was made to seal sump but seals have failed. Sump located in caustic storage area. Area has containment curb but also contains process drains wo values. Shell believes that for less than catastrophic failure, drains could be isolated with sandbags. Questionable:

Unit 4.44 Caustic Storage Tunk

Tank is within a curbed area but

area contains an uncontrolled process drain.

This appears to negate value of containment.

In any event, curbing is a square

approx 25' on side and approximately 1'

deep. Fiven the area already taken up

by the concrete Tank skirt the curbed

area would not have sufficient volume to

hold more than a small portion of the Tank

contents. Additional material would spill down

embankment to Tank storage area.

Unit 4.45 Caustie neutralizion/steam stripper small vertical unit. no evidence of prior spills. No containment.

underground Tank covered with concrete slabs. No evidence of release. No other observations possible. Adjacent to unit is a

Stormwater diversion ditch approx
15-20' wide and 100 yds long.
Surface and banks are oil fouled.
Baffel and skimmer installed at discharge.
Skimmer has had no apparent recent
use. Should be cleaned up.

Area 4.56.2 Studie Terraces

Not currently used. Studie is dry

Caked and apparently stable. No evidence

of off-site release.

Unit 4.25 APT Separator

Oily process water enters APT thru BaScreen. Automatically cleaned to hopper.

Bottoms from APT_gototwo Sandboxes in
Series. (units 4.27)

unit 4.29 Fash Hixer / Flocaulator

pH raised to 10.5 Inground units

No evidence of rolease

Unit 4.31 Flash Mixer
effluent to 2 pH 9
unit 4.37 Tank 1197 Sludge Storage
Sludge now transferred to 1065 directly, 1197 out of service, sometimes used Tank sits on gravel. Incomplete curbing
exists, would not provide containment.
Diseussion of Wastewater Treatment System
Water enters the wastewater treatment area
through a sewers; the oily water sewer

through a sewers; the value water sewer and the process water sewer. Flow is approx

Is oily, as process. Total dry flow is 4 HGD.

Oily water initially enters an API separator

thru an automatic bar screen. APIs are

set up as two paralell trains of two units

in series. Oil skimmed from the surface is

sent to holding Tank 1063. This oil is later

recovered and combined with untreated coude.

The bottom sludge from the APIS is sent to 2 Sand boxes, actually water tight dumpster type bins; where coke, sand, and heavy hydro-carbons are allowed to accumulate. At one time a centrifuge (unit 4.28) was used to further classify the bottom sludge in water, oil, and solid material phases. Operation of this centrifuge was apparently discontinued in 1919 except for a brief, unsuccessful attempt to use the unit in 1981.

The agreeous effluent from the API goes
to the Flash mixer / fleeculator (Unit 429) where
caustio soda is added to raise the pH to 10.5.

This is an interesting practice since the elevated pH should make the dissolved oils more soluble, however it has the adventage of precipating calcium and any other heavy metals in solution. This metal flow with will then enhance the operation of the DAF unit. The high pH probably also causes some ammonia to strip from the wastewater atthough this may not be significant. Other than pH adjustment, no flocculants or polyelectrolites

}_

are added prior to flotation. Oil skimmed from the surface of the DAF's is sent to holding Tank 1063. Aqueous underflow goes across the road to a Flash mixer (Unit ____ 4.31). Here sulfurio acid is added to ____ reduce the ptt to approximately 9 prior to biological treatment. From the flush miner the flow normally goes to the mixed Equalization Pond (Unit 4.32), however the flow may also be diverted to the Emergency Holding Pond (Unit 4-33). This is done during periods of extreem high flow or during shock loading periods. Wastewater from the emergency holding pond may later be pump to the equalization pond or directly to the biotreater. Wastewater from the equalization pond is pumped to the biotreater (unit 4.34). The biotreater has a one day detention time at dry weather flow. It receives about 9,000 #lday of BOD and contains approximately 77,000 # of biomass. The resulting FlM rates, 20.12, not supriseingly produces an effluent low in soluble.

BOD and highly nitrified.

The biological system is unique in that if utilizies 2 stage dissolved air flotation to achieve secondary clarification. Represserization is used between 1st and 2nd stages. Float from both stages is returned in its entirely to the aeration. No sludge wasting is done from the DAF's. Polymer addition is used to enhance solids capture. The 3 clarification units ar Unit 4.35

Sludge is wasted from the biotreater by pumping to the Biotreater Sludge Thickener (Unit 4.36). Supernate from the thickener is redurned to the influent point of the biotreater layour

Originally thickened shedge was sent to

Tank 1199 for st (unit 4.35) for storage

prior to transfer to Tank 1065 (Unit 4.42)

A the time of the USI, Tank 1199 was

not in use and se thickened solids were
being sent directly to Tank 1065.

clarified effluent from the districator

High concentration of floc and free oil passing over effluent wiers.

Knits 4.32 and 4.33

Both ponds surrounded by dearthen berms. Both are in good condition. No visual evidence of significant material loss from either pond. Internal surface of berm on emergency pond heavily coated with oil up to a point 23 ft from the top.

Units 4.38 and 4.40

Both ponde similar in construction to those discribed above but smaller. Ho evidence of loss or significant oil fouling in either pond.

Unit 4.34 Activated Sludge Biotreater

Large bermed pond with 3 fixed

and 6 floting aerators. No evidence of

previous losses from unit.

Unit 4.35 Air Flotation Clarifiers	-
Actually 3 Separate units	
2 Stage DAF with intermediate realizing	٤
No evidence or apparent potential	,
for loss of material.	· · · · · · · · · · · · · · · · · · ·
	·
Unit 4.39 Sand Filters	
Out of service at time of USI	
No indication of past release	
* completion of USI	
Nothing Follows	
Willia CH. 6 Hah 11/13/87	
- · · · · · · · · · · · · · · · · · · ·	
•	·

11/11/87	Pre-VII Meeting
	Miriam Conner
	Judith Moorad
	Jane Tocher
	Bob Bowen
. .	. •
•	Waste Sile Annestigation -
	addiced part landfill / LTA areas
	Pb 7 may have contributed
<u>.</u>	cr J
•	Submitted pential ROWO
	Wallace Reed - EPA
	: HLA _ Report _ = 3 volume - May 87
٠	References
Time of	O Site Investigation - May 1987 - HLA
Staty	(2) Solid Write account Test - Dune 1987 - Emcon
ws	3 Point at leby to Deschool - Our 82 IEG Pache Envir
	GIV Monteur Questerly Recent
1	3 Report of Waste Discharge - Aug '87 1EG Pacific Envir GW Montoning Quarterly Reports 3 Surface Impoundment Sampling & Analyses - June 17, 1987 Lames & Moore
Į	Lames & Moore
· · · · · · · · · · · · · · · · · · ·	
··· · · · · · · · · · · · · · · · · ·	27A - land form - spread
	Landfill - dump & fill
·	
DHC V	(5) Operating Plan by Studge Anda (Part & poster) Que 82
Cu-sid	3 Operating Plan for Sludge Bedo (Part B applie) ang 83
Charles white	A CONTRACT OF THE CONTRACT OF

now used for struwater retention. Clouve activities_ROWD - will be submitted Jan '88

Sludge analyses - Ref 2 ... To capping

Studge layer removed - offerte disposal - only excavation

leg'd to install alway wall around site - leyed in Received dredging from effluent treatment ponds . dredgings didn't meet reg'nts for EPA / State classif as lay wastes.

Sludge removal - lef 2:

Information in Ref 4 Unit dimensions - Ref 4 no operating details on when it was used for ballet water - lad a separator for oil -> Stop system in Now used storm water retention Clement analyses - no idea-

Ballant water - went back to WWTS - discharged under . NPDES permit

4.20 Gras oil scrarate

"not aware of box screen. . Wheter - untreated process water - no chem analyses __avail for layard constituents. In ground unt - w/ pump - to WWTS Collection apol for process ww DOS - 1966

42 Inactive Landfell "H" Unit dimensions - Ref 3 Waste man practices - Ref 1 · word have application rates Climical analysis - nothing available · waite charact. - Ref 1 No liners Bermo - Ref 3 Closure proved being developed - Ref 3 WSI - Ref. 1 * Other landfills / LTA - use same references. Those of the landfille are lived 4.16 - Oily Water Sump "N" undermeath warehouse buildings = early 80's Info in reference filled in & pared - no execution no knowledge of contain soil - mixed in & recompacted

7 4.26 Tank 1063
Takes all oil from API - not exparaled any more (10049 1063
3 5029 banels capacity
0 = 30' H= 40' Steel - floting roof w/ 2 seals
operates continuously - not quantified
7 Das 1962
Chemical analyses - not available
Souble sealed roof - for air emissions
Dut bern =
The sediments taken out
and the control of th
7.28 <u>Centrefuse</u> 2005 - 1962
no linger used - late 1980
To Chemical analyses
on concrete pad - in building - no berm
Used to separate water from oil
and the second of the second o
3 4. 29 WW Neutralystian
Flash mujer -
addition of causties & acids - pH_adjust (10.5 to
control coliform & aid in flow process)
Continuous operation
www from ARI
70 oil - no skimming
bas 1962
Analyses - same as API but different ptt

マラ・ラーラー

+ Isdam - any 85 (EPA File - Triangle Tank)
che al analyses of sludge

Cover - concrete slab (Screen is there but not really used).

4.21 Soft in Ref 4

No process water disclarged

Boom for collecting ords — to slop system

Weir - baffling

Solids settling out - lef 4

DOS - about the mid 50's

CAM parameters — lef 4

No liner

Berms - Ref 4

Two ponds - not three.

4.25 API Separation

OS - 1960'S (A62)

Quantities - from shipment records (specify has)

Chimical analyses

Eclaw grade - concrete cover - no berms - some

- parement

Overflow weir - to diversion pond

* Oct 23-1983 - Letter submitted to EPA requesting more info - chemical analyses of WWTS influent (from API)

4 33 www Holding Aondo

if ligh NH3 will devent to this point their back to system

Ref. Y

1.34 Restraction

Ref 4

To settled solido

0 ~ 1 day or less

005 ~ early 1970's

Analypes - Ref 4

Flow controlled at API

earthern - no lines

4.37 Tank 1197

Used only y 1065 is full

Concrete pad - not berned

7

4.35 Clarifiers
2-stage acration
Solids from 1st stage - 2nd stage

4.36 <u>Chidge Thekener</u>

From brotreater
effluent back to brotreater

solids to

analyses - Ref 4

no cover - no parement
No ove flow controls - controlled at API
no skimming unit
no flow added
430 <u>OAF</u>
Concrete, subsurface - two units
continuous operation
4 MED (dry)
8 MSD (wet) can go up to 6 MGD for person
limita purposes
Therming - on timer (merates - Lours)
005 - 1960's
analyses - same as flail muger
The second - no covers - controlled at ALT
To overflow control - controlled at AFI
Skin pito - part of unit
431 $4 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +$
431. Neutralization unit - not really a mixer
pH adjust to ~ 9
e de la composição de lacerda de la composição de la comp
432 <u>Equalization pardo</u>
Two connected ponds
8 1 day on less Q = 4 M60
pH = 8.8
Oralyses - Ref 4 Solido removed in 1976 Continuous operation periodically removed
Flav controlled of API
Unlined - berned
always effluent - prior to APE used for
a thing

;)	
7	en de la companya de
3 4.78 77(L) Drus	type - solido containing metals (EP Tex) and oils filter cartridges bolding area - from process areas
West	lipses - solido containing melalo (EP 11x1 and oils
7	- tolding area - grow process areas -
	rete pad - not coaled
	m- concrete curb-
- * ♥	an cover and a sure of the sur
7	o spill
	o sump or drain - namurater accumulates
4	ums on pallets - from water contact
7	
-3	actor does cleaning - solvents
<u> </u>	
3- 4.19 Waste 7	
-20. ya	, <i>,</i>
<u> </u>	orly track
	- sulfur
<u> </u>	line
<u></u>	non- Rayardris track
3	
Con	mor collection part for wastes generated from
-	process areas
Cor	ente pad = no costing = no bern - no cover
	Ised 1982 - 1983
	rade - concrete (?)
	lipes - none available for HW
Cove	red -> concrete - not berned
A * A	

4.38 Sand Filter Food Pond

Weed to Sare overf

Used to have overflow to final holding pond DOS - 1982 - separated from holding pond Continuous flow a ~ 4 M60

analyses - Rof 4 Unlined - bermed

Flow controlled at API

4.39 Sand Filters

005 1983

Continuous operation

analyzes - same as feed pond

not covered - on conercte pad - no berm

Operation is furnition of strail water levels (0)
Ref 4

4.42 Knoch out Pot (V-511)

Stand-by unit for high-flow conditions;

Functions same as (V-510)

POS 1966

Concrete pad - no bern

Steel

443 Caustie Sump Caustie from V-510, V-511 Subgrade To clemical analyses

4

--

High level alarm - inducates when to empty sump. *

** Facility has drawing of this system.

744 Tank 952

No chem analyses

Previous use? will find out
Concrete pad - w/ concrete berm

Constructed 1947 - placed into service May 1981

An - line unit

Day 1966

The chem analyses

Concrete pad - no berm

Also a stripping unit - phenolo & cripo. stripped to

sour water stripper

4,23	CPI Warte Ein
NP 24 - 17	Dos - 1983
	No chemical analyses
	disportion:
4.24	CPI Durgeto
	20 yel portable has - roll top
	material basically cohe (solids)
	Vacuum truck removes - combrand w/ solids from 605
	4) owned by critication
	Concrete pad - not bermed
427	Sand Box
•	Holds solds from AFI
	Portable 20 ye ira (2) - metal
	Continuous diecharge into box
	·
	005 ~ 1984 (407)
•	analyses - Ref (API)
	not pared - not covered - no beron
	Solido - offerte deporal to Hus facility
	and the second of the second o
	
4.41	Sulfide Flack Pot (V-510)
ē.	accum point for caucties - le remove causties
	. weally used (v-510)
	and teal and the state of the s
- 4	DOS 1966
	no chemical analyses
	Concrete pad - no berm

$m{+}$,
4.50 CO Boiler Bust Storage Rin (Hopper)
Steel
Main lopper - continuous collection
1966 (ocs)
will get chemical analyses
covered - no bermo - pavement below
4.51 Dumpter Dox
Removed - aug 87
Now bagged - under hopper = accumulated or
concrete sad in LOP area (temporary)
4.3
Pos 1966
analysis - will get
4 = 4 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +
4.52 Located in Pettaburg Cotalyst Plant - under separate
4.53 EPA ID NO - OWN ISD
- 4.54 Tark 482
Holds toluene atream (liquid not sludge) Botch process - f (catalyst sale)
Holds toluene atream (liquid not sludge) Botch proces - f. (catalyst sale)
Concrete pad a building - no bern Waster leld ~ 3.4 days prior to meinerator discharge
Waster held ~ 3.4 days prior to meinerator discharge
7.55 _ Incircation
Chemical west "C" area (morth of marina viole) Wastes from catalyst operations
The state of the s

4.46

P.B. Storage Area

adjacent to HW drum strage area

Concrete pad - coated - epoly resim

Possibly a crack - reason for coating

Berm - concrete - coated

Track cirtaminated w/ RB, exp oils, capacitors

streed in drums

Covered

4 47

Tank 1065

Effluent treatment plant area.

Receives DAF float & brosolids (100 +/day)

(30 tons/day)

Analyses - Fart B (May 1986) for CO Boilers

Unpaved - berned area.

Pervolvedly receives waste from 1197 if in use

448

Tank 383

arralyses - same as 1065

Sludge Continuously sumped to CO Gorles.

Concrete sad - no berms

FRP lined.

4.49

CO Borlers

LOP area

Bolers routinely inspected by outside insurance co.

Tank 1064 Status change when centrifuge taken out- 1982

- @ Leading areas
- 1 Fire Training area .
- 3 Catalist boy area
- W
- Do longer own no waste manage activity known
- and purchased by Shell -for LCP

 To gus contam in quarterly reports
 Closure destroyed beds no puddling

 regraded don't know of warter removed

4.56, 3 Same unit as 4.51

- Aso strage Rin

 not hay are to state & EPA

 diatenoceous conth filters out

 will get chem analyses.

 10 cuyd covered portable

 not currently used
- 5 Spent Caustie Storage Tank
 To information possebly Tank 62
- O Tank SS (Tank 881)

 005 Cleaned ~ 1983 1984

 stored by-product for chem process onca
- Hydrogen reformer ferrance

- Tank 912 → Should be Tank 1218
- contained spent acid for pH control

1)	*	
•	<u>USI</u>	11/12/87
(1)	n garage and a grant and a	=
-	LF 4/4 - "PA"	
(Osan fell - piles around cette.	-
(4)	30' slew change	andraw - NPK
1	drowing area = SE and - drowns to store duc	charge
)	no release controls	
(****
(LF 4.12 _ LF '2' "	
)	see phito log	a ra an
•		
	1F 4.11 "Y"	
	Now covered by scrap motorals	and Arman in the Control of the Cont
	Now covered by scrap motorals	
, 🖜		
-		<u> </u>
3	<u> </u>	
	Ton sludge were placed in here	in the second of
-	Tank bottons	
-	Porto slover - nend	
-	Peyton slough - n end Internettent (east)	
	Some represent seconse of tary material	
	Unit 4.13 LF 'AA"	and the second s
•	6 Pondo - NPDES discharge	<u> </u>
	Catalysta - Water treatment channelle	, i ij ist alis en g _{ere} er i i
	4' kigh earthern bermo.	non-sale hazin is in
		<u>.</u>
 		

Loading areas - not wastes -

Warelouse now constructed one site

Unit 4.6 "m"

Two lobes

Tow covered by process area

Process areas:

asphalt, sulforotten, chemical A: B area

Tank 482 V (4.54).

No signs of release.

Sered versel - mounted on 8' concrete pad

ASD Filler Cake Bino (4.56.4)

Incinerator (4.55)

Not operating
To super of release

=

_

~ 3

-4

4-23 CPI Walter Schmidt - Senior Eng on Flexi- Color Coroned (metal plates)
orly powement - cover also only

· large o/w shemmer - plate interceptor: takenout

· weir - wy level control purps

· Sludge collected in bins(3) (cole sludge) (4.24)
- when full - shut down to clear out

cohe sludge jumped out > back to precess since

to flow freeze

bins-water - CPI

4.23 - www. comband w/ slindge of - 4.24

Mont 4.16 """

Now faced over - en front of wavehouse Unit 4.7 "0" Now a sand bleeting area Tagel clay - deposited here Waite ples from shatdown of flexicoler operation Unit 4.8 "Q"
- Cay dispose area. 4.21 - Loke 500 The drawing Paved over - truck weighing area 11-7 4.12 "K" center of area draws to www. Und 4.4 "L" Now fire training area.

product plume detected in mw in swamer

Unit 4.5 -Cranh care oil recycling operation operation details sketchy 2 tanks - no liquid lack - bottom of one officers to how only sludge on bottom - Running water in bottom of earthern hole / covered - with wood state. 4.19 Waite Transfa Station

Hw in - oily cardboard / rags -in urpared area - partially berned ____ 4.51_ Boiler area______ - Dust loading operation taking place 10 -> sump -> (increased -flow of countre) V 510: Flack pot because of C-3 & 2-4's __ U 511: Upset condition > more gasoline in flow

4.24 - 3 hm 2 full 1 empty - weed for aeration - roll away - covaried

Avin : w (unt 49)
Tow leaved by Ecostan
Lovered by parking but & fartially by building

9- TREA solids - tertary butly alcohol

9- Slop tank - celete, octylformyl

2- cartistic filler from gasoline fittering process

asphalt panel - asphalt curb ~ 4" high 4" wide

trums on pallets - drums in good shape

no signs of release - no leading drims

curb slowing signs of deterioration - drums dopped

on south early

overflow pape - N ande

Convete curl- 6" H 4"W - coated

4 drums good condition

no sign of release

Two-part spoky coulding: "Kopper Splack Zone A-788"

605 = Q 375 gram

Non-oil streams (downstream of API)
1865 gpm) water blowdown
cooling town blowdown

Pond 6 - in Surface water report not ID'd in our report

Tank 1018 4.56.9

now used for coke slurry
on arphably gad - in verm

Unit 4.1

Originally designed for sludge drying from Ponds 32 4.

But some wied for that purpose.

Discharge point (?) well Check on

granty water > back to AFI

orl'dry" -> 1063 -> resum system ->

Tark 1064 to voter

Crude unit

all tanks on aspholt pais gravel around pad gard/sather berm

1065 - brooks & DAF Float

Borler Fires Storage area in LOP area - New SWMU Bay shipment every other week. 35-40,000 ils Mid July - any 87 - stated using Jago Will construct contrate pad à bern - on fence signo, etc -10 bags - on fallets covered w/ plante no other streams into sever besides 190 1511 WWTS Da Glage Can Ecremo = him -> liquid & pringer out - API would to transper and are 3 set sir flotation clarifier (4.35) for each Secondary - cone to Secondary - cone - Tank 1197 - not used anymous

well be flathe living berms around 1955 ! 1567
Born around all but Saide of Tank area

Tark 1218

The used for spent and storage

Tank 781
Ollyh Chloride - no longer used

waste!" - shaped effects (Stanffer!)

drawage was to proces were.

Tank 218T (4.56.8 "RR")

Used and storage - no longer used

- Stauffer

tank cleaned out

Not really solid wante - because it was being

reclaimed (H2504)

CFI Bix idea of process for coke

Feed to courtie sump - T510 - 511 only

- tar sludges oil drain sump area. (means KF "L") 3 storm drainage Area "K" HW storage ara - possible runon problem Cracked sever line -Ballast Pond - history unknown.